Standard Communications
SATELLITE & BROADBAND
PRODUCTS DIVISION

MT930B

International and Domestic
Satellite Receiver
Model: MT930B

SATELLITE
BROADBAND

SERVICE MANUAL

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MT930B

SERVICE MANUAL

This manual is intended for experienced application developers. The manual contains the information needed to understand the MT930B protocol. This protocol allows a control program running on a personal computer to manage multiple MT930B receivers. Changes that occur after the date of printing will be incorporated in supplemental bulletins or later editions of this manual.

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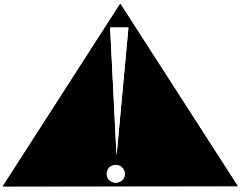
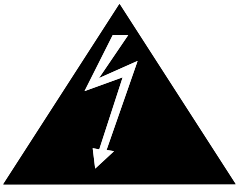
SAFETY CONSIDERATIONS



CAUTION

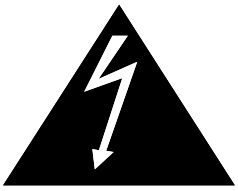
RISK OF ELECTRIC SHOCK

DO NOT OPEN

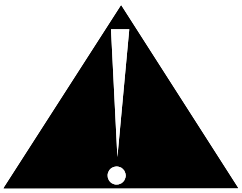


AVIS – RISQUE DE CHOC ELECTRIQUE – NE PAS OUVRIR

For user safety, one or more of the caution labels shown here may have been affixed to the side or rear panels of this equipment. The significance of the two symbols exclosed by triangles is described below:



This symbol means that dangerous voltage levels are present within the equipment. These voltages are not insulated, and may be of sufficient strength to cause bodily injury if touched. The symbol may also appear on schematics:



This symbol calls attention to a critical procede, or means refer to the instruction manual for operating or service information. Only qualified service personnel are to install or service the equipment. The symbol may also appear in text and on schematics.

WARNING: TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE!

This manual is intended for use by the end user and qualified technicians. It includes all necessary information pertaining to MT930B-series Receiver applications and installation. Changes that occur after the date of printing will be incorporated in supplemental bulletins or later editions of this manual.

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SAFETY ADVISORY

1. **Read These Instructions First** – All safety and operating instructions should be read before installing or operating this equipment. Safety and operating instructions should be retained for future reference.
2. **Cleaning** – Unplug the equipment from the AC power outlet before cleaning. Do not use liquid or aerosol cleaners.
3. **Ventilation** – Do not block or cover slots and openings in this equipment. These are provided for ventilation and protection from overheating.
4. **Power Sources** – Operate this equipment only from the type of power source indicated on the rear panel.
5. **Grounding or Polarization** – This equipment is equipped with a polarized AC line plug. This plug will fit into the power outlet only one way. If you are unable to insert the plug into the outlet, try reversing the plug. If the plug still does not fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of a polarized plug.
6. **Servicing** – Refer all servicing to qualified SCC personnel. Opening or removing covers may expose dangerous voltages. When replacement parts are required, make sure the service technician uses only replacement parts recommended by SCC. Unauthorized substitutions may result in fire, electric shock, or improper operation of the unit.
7. **Lightning** – For added protection during a lightning storm or when the equipment is left unattended or unused for long periods, unplug it from the power outlet and disconnect the cables between the equipment and the antenna subsystem. These precautions will prevent damage to the equipment that could be caused by lightning strikes or power line surges.

NOTE: This reminder is provided to CATV system installers to call your attention to NEC Articles 810-21, 820-22, and 820-40 that provide guidelines for proper grounding. In particular, these articles specify that the cable ground shall be connected to the building grounding system, as close to the point of cable entry as practical (see Figure 1).

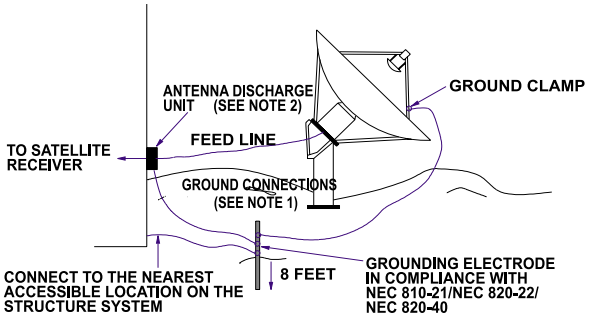
ANTENNA DISCHARGE UNIT (SEE NOTE 2)
GROUND CLAMP
FEED LINE
TO SATELLITE RECEIVER
GROUND CONNECTIONS (SEE NOTE 1)
CONNECT TO THE NEAREST ACCESSIBLE LOCATION ON THE STRUCTURE SYSTEM
8 FEET
GROUNDING ELECTRODE IN COMPLIANCE WITH NEC 810-21/NEC 820-22/ NEC 820-40
NOTES:
1. USE #10 AWG (5.3 MM2) COPPER, #8 AWG (8.4 MM2) ALUMINUM, OR #17 AWG (1.0 MM2) COPPER-CLAD STEEL OR BRONZE WIRE, OR LARGER, AS THE GROUND WIRE.
2. MOUNT THE ANTENNA DISCHARGE UNIT AS CLOSE AS POSSIBLE TO WHERE THE FEED LINE ENTERS THE BUILDING.
9001

Figure 1. Typical Antenna Grounding

CAUTION: For continued protection against risk of fire, replace the fuse (if necessary) with one of only the same type and rating.

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READ ME ! .....iv (next page)

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LIMITED WARRANTY

GOLD STANDARD PROGRAM

READ ME !

Most users want to do a quick check before reading all the details on the receiver's capabilities, so the following should get you video and audio. Please, in the near future, read the remainder of the instructions to find out about the great features hidden in the menus.

1. Rack mount the unit or set on bench top with air clearance.
2. Hook up an L-band signal to F connector(s) at Port 1,2,3 or 4. We recommend C-band Vertical be connected to #1, C-Band Horizontal to #2, Ku-band Vertical be connected to #3, Ku-Band Horizontal to #4 to maximize the preprogrammed database which assumes these connections. Hook up outputs as needed.
3. CHECK THAT RECEIVER IS SET TO 115 or 220 VAC as required in your facility. Connect power cord to receiver, then to wall. Display messages or a Port LED lighting shows you are powered up.
4. After front panel display completes startup messages, rotate MENU knob to show #1 ACTIVE CHANNEL in top line of the display. Press EDIT and rotate SELECT knob to obtain the satellite format you desire (e.g. 'C-BAND'). Press RIGHT button, then rotate SELECT knob to chose the transponder you desire. Press SAVE to capture the changes. You should have video and audio. If you are using a satellite that is not in the database, select one similar (i.e., Ku band type) and edit downlink frequency, as in 6, below.
5. If you are not receiving video and audio, consider reading the entire manual now. However, you can rotate the MENU knob and return to ACTIVE CHANNEL again. If satellite and transponder are not those desired, repeat above entry process. If satellite and transponder are correct, go to 6.
6. If theLED in EDIT button is on, press EDIT to turn it off. Rotate SELECT Knob. Confirm that the parameters in each menu are correct for your input port selection, polarity, LO, downlink frequency, etc. There are twelve sub-menu pages to check!! In a sub-menu page, press EDIT, and move cursor with LEFT or RIGHT BUTTON, then rotate SELECT knob. The receiver will make the changes as you input them, real time. To back out, press EDIT again. Press SAVE **once** to keep the change. To keep from messing up the factory fresh database, press SAVE only once and press EDIT key when the screen asks if you wish to save the change to the database.
7. Check that the LNB is powered from your facility; the receiver comes with the LNB power blocked; rotate the Menu knob to show Menu #5-1, RECEIVER CONFIG. LNBV will be OFF. To change, press EDIT, RIGHT button, rotate the SELECT knob, then SAVE. This switch is global and supercedes all other receiver settings including the LNB setting recorded in ACTIVE CHANNEL and DATABASE SETUP.

If still no video and audio, double check the above, then read the rest of the manual or give the folks at Standard a call.

CHAPTER 1

GENERAL INFORMATION

SCOPE

This manual is offered to Standard Communications Corp. (SCC) service dealers to provide detailed service information for the indicated equipment. This information includes service diagrams, parts lists and printed circuit board layouts.

DESCRIPTION

The MT930B Satellite Receiver is an international, multi-standard, broadcast quality 950 to 2150 MHz PLL-synthesised satellite receiver.

These units feature digitally locked, continuous-tuning AFC and microprocessor controls. The C-band and Ku-band 950 to 2150 MHz radio frequency (RF) inputs are dual-converted to a commercial, industrial-standard 70 MHz intermediate frequency (IF).

The MT930 Satellite Receiver design uses a new 70 MHz IF conversion circuit that enables direct satellite processing of signal at the up/downlink site. This circuit also provides more consistent video to the demodulator because it does not require that the signal be processed to the baseband.

The front panel design incorporates a three-function meter that displays signal strength, fine-tune, and carrier-to-noise (C/N).

The real-time C/N meter and alarm features consistently monitor the receiver signals with maximum power ability. The tune meter enables precise fine-tuning of the receive signal, and the signal meter is calibrated like a spectrum analyzer, in dBm units.

Multiple video low-pass filters and de-emphasis networks enable the MT930B Satellite Receiver for NTSC, PAL, SECAM, and MAC operation, along with all known video scrambling formats. The multi-tap power supply with two voltage settings decreases heat and power consumption, and is designed for 24-hour-a-day operation.

FEATURES

What follows is a long list of tailored features.

- Operation, performance, and features are specifically designed for the professional broadcaster
- PLL control of RF center frequency and audio sub-carriers

- Front panel indication of satellite format, channel number, upper/center/lower transponder channel, antenna polarity, audio subcarrier frequencies, IF bandwidth, signal strength, and C/N ratio
- Remote and local control capability for all operating functions
- Four separate RF inputs
- 70 MHz IF bandwidth selection capability of 16, 18, 22, 25, 27, or 36 MHz
- SAW technology for bandwidth filters
- Up to three internal audio subcarrier demodulators for #1, #2, and #3 audio
- Front panel 70 MHz IF test connector
- Connectors available for external insertion of notch filters in the 70 MHz IF signal path
- Built-in current-limited 13 / 18 Vdc with ON / OFF for powering low-noise block downconverters (LNBC)s and low-noise amplifiers (LNA)s
- Front panel analog meter that displays signal strength in dBm, C/N ratio, and RF fine-tuning
- Output for remote display of signal strength
- Standard Communications' Gold Standard Support Program, 7-year Guarantee, and Lifetime Loaner Program
- Internal nonvolatile memory for automatic selection of the following:
  - Transponder center frequencies
  - Six different 70 MHz IF bandpass filters
  - Antenna polarity for each channel
  - Audio subcarrier center frequency
  - Audio subcarrier bandwidth
  - Audio subcarrier de-emphasis values
  - Video polarity
  - Documented RS250B (satellite) broadcast proof-of-performance and certification
  - Computer interface makes tracking possible and setting of multiple receivers either on-site or remotely, using a personal computer
- Rebroadcast-quality, certified performance on NTSC, PAL, SECAM, and MAC signals
- Precision microprocessor-controlled, dual-conversion, PLL RF tuning
- Digital AFC tracking circuit with continuous fine-tuning ability
- 70 MHz IF with spectrum inversion circuit for uplink turnarounds

- Attractive and easy to install in a standard 19-inch rack
- Low-profile chassis design, for reduced rack space consumption
- Multi-tap power supply, with two voltage settings
- High-quality terminal strips are easily wired for whichever configuration chosen

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CHAPTER 2

MT930B SPECIFICATIONS

GENERAL

Primary Power	115 / 230 (+ 6% - 10%)VAC
Line Frequency	50-60-Hz
Power Consumption	≤ 72 W
Operating Temperature Range	14 to 104°F (-10 to + 40°C)
Operating Altitude Range	0 to 20,000 feet (0 to 6,100 meters)
Operating Humidity Range (Non-condensing)	0 to 95%
Dimensions (H x W x D)	1.73 x 18.97 x 18.93 inches (44 x 482 x 481 millimeters)

RF CHARACTERISTICS

RF Input Tuning Range*		950 to 2150 MHz
Tuning Step Size*		1.0 MHz
Fine Tuning Range*		± 2.0 MHz
AFC Range		± 2.0 MHz
Input Level (per Channel, Loaded with 24 Channels)		- 20 to – 65 dBm
Input Impedance		75 ohms
Input Return Loss		≥ 9 dB
Input Isolation		≥ 40 dB
Between Input 1 to 2, 3, and 4		
Between Input 2 to 1, 3, and 4		
Between Input 3 to 1, 2, and 4		
Between Input 4 to 1, 2, and 3		
Gain Variation		≤ 8 dB
Image Rejection (1st IF)		≥ 30 dBc
IM3 (-25 dBm Input)		≥ 50 dBc
Noise Figure		≤ 15 dB
Local Oscillator Leakage at RF Inputs 1, 2, 3, and 4		
0.9 to 2.2 GHz and 3.7 to 4.2 GHz		≤ - 55 dBm
All other Frequencies		≤ - 45 dBm
AGC Output (into 10 kΩ Load)		0 – 4.8 V dc
LNB Power Voltage	High 550 mA	≥ 18.0 ≤ 20.0 V
	Low 300 mA	≥12.7 ≤ 14.0 V
LNB Power Maximum Current		≥ 500 mA

* C-Band standard 24-channel format with 20 MHz channel step.

(Continued)

IF CHARACTERISTCS

1st IF Frequency		479.5 MHz
1st IF Bandwidth at –3 dB		≥ 40 MHz
2nd IF Frequency		70 MHz (AFC adjust in center detent)
Image Rejection (2nd IF)		≥ 30 dB
2nd if Bandwidth (16 MHz BPF)	At – 3	16.0 ± 1.0 MHz
	At – 25	≤ 26.5 MHz
2nd if Bandwidth (18 MHz BPF)	At – 3	18.0 ± 1.0 MHz
	At – 25	≤ 26.5 MHz
2nd if Bandwidth (22 MHz BPF)	At – 3	22.0 ± 1.0 MHz
	At – 25	≤ 34.0 MHz
2nd if Bandwidth (25 MHz BPF)	At – 3	25.0 ± 1.0 MHz
	At – 25	≤ 37.0 MHz
2nd if Bandwidth (27 MHz BPF)	At – 3	27.0 ± 1.0 MHz
	At – 25	≤ 50.5 MHz
2nd if Bandwidth (36 MHz BPF)	At – 3	36.0 ± 1.0 MHz
	At – 25	≤ 60.5 MHz
Spurious (by 2nd IF)		≤ - 30 dBc
AGC Range for Minimum Output Level (Max. Gain, I dB Change from Reference)		≤ - 65 dBm
FM Dynamic Threshold C/N (First Sparkles)		≤ 13.5 dB
FM Static Threshold C/N (Input: J301; - 30 dBm, Monitor: J202)		≤ 8.5 dB
IF Test Output	Level	- 30 ± 2.0 dBm
	Frequency	70 ± 0.1 MHz
Overall 20 MHz Bandwidth Ripple		≤ ± 2 dB
IF Loop Input and Output Impedance		75 ohms
IF Test Output Impedance		75 ohms
IF Loop Level (RF Input – 30 dBm to – 50 dBm)	Level	- 30 ± 2.0 dBm
	Frequency	70 ± 0.1 MHz

(Continued)

COMPOSITE VIDEO OUT

	525 Lines (BTSC)	625 Lines (PAL)
Deviation Range for 1 Vp-p Output	10.0 to 27.6 MHzp-p	9.0 to 24.0 MHzp-p
Line-Time Distortion	± 1.0%	± 2.0%
Short-Time Distortion	≤ 2.0%	N/A
Field-Time Distortion	≤ 3.0%	≤ 4.0%
Pulse / Bar Ratio	N/A	± 3.0%
Differential Gain 10% to 90% APL (C-Band)	≤ 4.0%	≤ 4.0%
Differential Gain 10% to 90% APL (Ku-Band)	≤ 3.0%	≤ 3.0%
Differential Gain 10% to 90% APL (C-Band)	≤ 2.5 degrees	≤ 4.0 degrees
Differential Gain 10% to 90% APL (Ku-Band)	≤ 1.5 degrees	≤ 3.0 degrees
Luminance Non-Linearity	≤ 5.0%	≤ 5.0%
Chrominance-Luminance Gain Inequality (Modulated Pulse-PAL)	± 4.0%	± 3.0%
Chrominance-Luminance Delay Inequality	± 15 nsec	± 20 nsec
Chrominance-Luminance Intermodulation	± 2.0%	± 2.0%
Chrominance Non-Linear Gain	± 3.0%	N/A
Chrominance Non-Linear Phase	± 2.0 degrees	N/A
Gain Frequency Distortion	± 0.51 dB at 0.5 Hz to 3.58 MHz ± 0.83 dB at 3.58 to 4.2 MHz	± 0.51 dB at 0.5 to 4.0 MHz ± 0.83 dB at 4.0 to 4.8 MHz
Frequency Response	± 1 dB at 8.0 Hz to 6.0 MHz ± 3 dB at 6.0 to 10 MHz	± 1.0 dB at 0 to 8 Hz to 8.0 MHz ± 3.0 dB at 8.0 to 10 MHz
Composite Output Impedance	75 ohms	75 ohms
Output Return Loss at 0 to 4.0 MHz at 4.01 to 6.0 MHz	≥ 40 dB ≥ 40 dB	≥ 40 dB ≥ 40 dB
70 MHz IF Signal Leakage	≤ - 50 dBm	≤ - 50 dBm

(Continued)

VIDEO (#1 AND #2) CHARACTERISTICS

	525 Lines (BTSC)	625 Lines (PAL)
Deviation Range for 1 Vp-p Output	10.0 to 27.6 MHzp-p	9.0 to 24.0 MHzp-p
Line-Time Distortion	± 1.0%	± 2.0%
Short-Time Distortion	≤ 2.0%	N/A
Field-Time Distortion	≤ 3.0%	≤ 4.0%
Pulse / Bar Ratio	N/A	± 3.0%
Differential Gain 10% to 90% APL (C-Band)	≤ 4.0%	≤ 4.0%
Differential Gain 10% to 90% APL (Ku-Band)	≤ 3.0%	≤ 3.0%
Differential Gain 10% to 90% APL (C-Band)	≤ 2.5 degrees	≤ 4.0 degrees
Differential Gain 10% to 90% APL (Ku-Band)	≤ 1.5 degrees	≤ 3.0 degrees
Luminance Non-Linearity	≤ 5.0%	≤ 5.0%
Chrominance-Luminance Gain Inequality (Modulated Pulse-PAL)	± 4.0%	± 3.0%
Chrominance-Luminance Delay Inequality	± 15 nsec	± 20 nsec
Chrominance-Luminance Intermodulation	± 2.0%	± 2.0%
Chrominance Non-Linear Gain	± 3.0%	N/A
Chrominance Non-Linear Phase	± 2.0 degrees	N/A
Gain Frequency Distortion	± 0.51 dB at 0.5 Hz to 3.58 MHz ± 0.83 dB at 3.58 to 4.2 MHz	± 0.51 dB at 0.5 to 4.0 MHz ± 0.83 dB at 4.0 to 4.8 MHz
Frequency Response	± 1 dB at 8.0 Hz to 6.0 MHz ± 3 dB at 6.0 to 10 MHz	± 1.0 dB at 0 to 8 Hz to 8.0 MHz ± 3.0 dB at 8.0 to 10 MHz
Composite Output Impedance	75 ohms	75 ohms
Output Return Loss at 0 to 4.0 MHz at 4.01 to 6.0 MHz	≥ 40 dB ≥ 40 dB	≥ 40 dB ≥ 40 dB
70 MHz IF Signal Leakage	≤ - 50 dBm	≤ - 50 dBm

(Continued)

AUDIO #1 FM DEMODULATOR CHARACTERISTICS

Sub carrier Frequency Tuning Frequency	0.05 to 9.995 MHz		
IF Bandwidth At – 3 dB / - 20 dB Ref. Max. Level	440		440 ± 60 / 720 ± 180 kHz
	330		330 ± 50 / 540 ± 120 kHz
	150		150 ± 40 / 300 ± 90 kHz
Minimum Input Level at 150 kHz Bandwidth Hum and Noise = 68 dB S/N			≤ 10 mV rms

AUDIO #1 OUTPUT CHARACTERISTICS

Output Impedance			600 ± 30 ohms
Output Level	300 kHz p-p Deviation 440 kHz p-p IF Bandwidth		≥ 18dBm
	300 kHz p-p Deviation 330 kHz p-p IF Bandwidth		
	300 kHz p-p Deviation 150 kHz p-p IF Bandwidth		
Frequency Response De-emphasis 50 µsec, 75 µsec, J17, or Flat	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth		± 2 dB (20 Hz to 15 kHz)
	300 kHz p-p Deviation 330 kHz p-p IF Bandwidth		
	100 kHz p-p Deviation 150 kHz p-p IF Bandwidth		
Harmonic Distortion at 1 kHz	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth		≤ 1%
	100 kHz p-p Deviation 330 kHz p-p IF Bandwidth		
	100 kHz p-p Deviation 150 kHz p-p IF Bandwidth		
Hum and Noise at 20 Hz to 15 kHz; De-emphasis = 50 µsec, 75 µsec; Input Level = 100mV	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth		≥ 72 dB
	100 kHz p-p Deviation 330 kHz p-p IF Bandwidth		≥ 66 dB
	100 kHz p-p Deviation 150 kHz p-p IF Bandwidth		≥ 60 Db
Channel Separation Audio #1 to #2; #1 to #3 Audio #2 to #1; #2 to #3	440 / 330 kHz IF Bandwidth	100 Hz	≥ 68 dB
		1 kHz	≥ 68dB
		10 kHz	≥ 55dB
	440 / 330 / 150 kHz IF Bandwidth	100 Hz	≥ 61dB
		1 kHz	≥ 68dB
		10 kHz	≥ 55dB

(Continued)

AUDIO #2 AND #3 FM DEMODULATOR CHARACTERISTICS

Sub carrier Frequency Tuning Frequency		0.05 to 9.995 MHz
IF Bandwidth At – 3 dB / - 20 dB Ref. Max. Level	880 kHz	880 ± 200 / 1540 ± 350 kHz
	440 kHz	440 ± 60 / 720 ± 180 kHz
	220 kHz	220 ± 50 / 410 ± 100 kHz
	110 kHz	110 ± 40 / 230 ± 80 kHz
	55 kHz	55 ± 15 / 125 ± 35 kHz
Minimum Input Level at 100 kHz Bandwidth Hum and Noise at 68 dB S/N	≤ 10 mV rms	

AUDIO #2 AND #3 OUTPUT CHARACTERISTICS

Output Impedance		600 ± 30 ohms
Output Level	300 kHz p-p Deviation 880 kHz p-p IF Bandwidth	≥ 18 dBm
	300 kHz p-p Deviation 440 kHz p-p IF Bandwidth	
	300 kHz p-p Deviation 220 kHz p-p IF Bandwidth	
	100 kHz p-p Deviation 110 kHz p-p IF Bandwidth	
	50 kHz p-p Deviation 55 kHz p-p IF Bandwidth	
Frequency Response De-emphasis 50 µsec, 75 µsec, J17, Panda	800 kHz p-p Deviation 880 kHz p-p IF Bandwidth	± 2 dB (20 Hz to 15 kHz)
	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth	
	200 kHz p-p Deviation 220 kHz p-p IF Bandwidth	
	100 kHz p-p Deviation 110 kHz p-p IF Bandwidth	
	50 kHz p-p Deviation 55 kHz p-p IF Bandwidth	
Frequency Response De-emphasis Flat	800 kHz p-p Deviation 880 kHz p-p IF Bandwidth	≤ 1%
	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth	
	200 kHz p-p Deviation 220 kHz p-p IF Bandwidth	
	100 kHz p-p Deviation 110 Hz p-p IF Bandwidth	
	50 kHz p-p Deviation 55 kHz p-p IF Bandwidth	

(Continued)

AUDIO #2 AND #3 OUTPUT CHARACTERISTICS (CONTINUED)

Harmonic Distortion at 1 kHz	800 kHz p-p Deviation 880 kHz p-p IF Bandwidth		≥ 1.0%
	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth		
	200 kHz p-p Deviation 220 kHz p-p IF Bandwidth		
	100 kHz p-p Deviation 110 kHz p-p IF Bandwidth		
	50 kHz p-p Deviation 55 kHz p-p IF Bandwidth		
Hum and Noise De-emphasis 50 µsec, 75 µsec,	800 kHz p-p Deviation 880 kHz p-p IF Bandwidth		≥ 81 dB
	400 kHz p-p Deviation 440 kHz p-p IF Bandwidth		≥ 75 dB
	200 kHz p-p Deviation 220 kHz p-p IF Bandwidth		≥ 69 dB
	100 kHz p-p Deviation 110 kHz p-p IF Bandwidth		≥ 68 dB
	50 kHz p-p Deviation 55 kHz p-p IF Bandwidth		≥ 62 dB
Channel Separation Audio #1 to #2; #1 to #3 Audio #2 to #1; #2 to #3 Audio #3 to #1; #3 to #2	880 /440 / 220 kHz IF Bandwidth	100 Hz 1 kHz 10 kHz	≥ 68 dB ≥ 68 dB ≥ 55 dB
	110 kHz IF Bandwidth	100 Hz 1 kHz 10 kHz	≥ 61 dB ≥ 68 dB ≥ 55 dB
	55 kHz IF Bandwidth	100 Hz 1 kHz 10 kHz	≥ 61 dB ≥ 63 dB ≥ 50 dB

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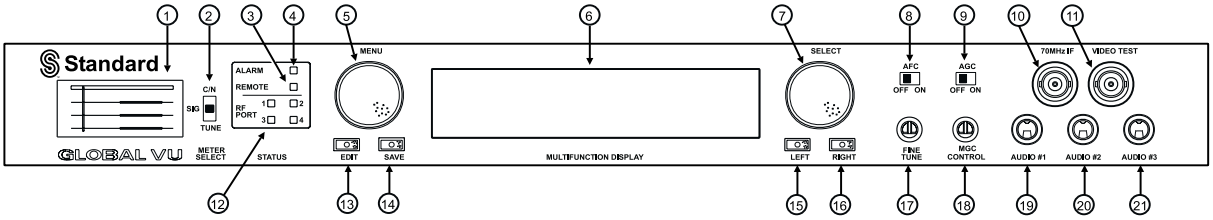
CHAPTER 3

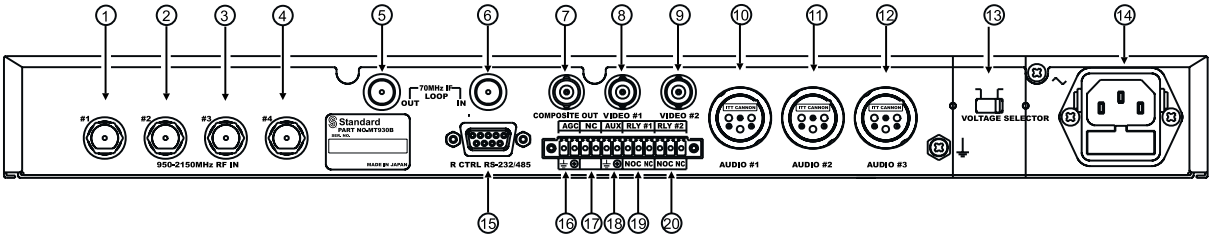
CONTROLS AND CONNECTIONS

FRONT PANEL



1. **Meter**—Signal strength, Carrier-Noise, Tune Indicator.
2. **Selector**—Three-position slide switch. Selects meter options.
3. **Remote Control Indicator**—Red LED indicated remote active.
4. **Summary Alarm Indicator**—Red LED is on when alarm is triggered.
5. **Menu Knob**—Rotary switch. Selects available menus.
6. **Display**—LCD panel. Displays menus and submenus.
7. **Select Knob**—Rotary switch. Scrolls through available Menu pages.
8. **AFC On/Off**—Two-position slide switch enables/disables AFC.
9. **AGC On/Off**—Two-position slide switch enables AGC.
10. **70 MHz Test**—BNC connector for IF monitoring.
11. **Video Test**—BNC connector for baseband video monitoring.
12. **RF Input Port Indicator**—Green LED shows which input is active.
13. **Edit**—Pushbutton. Allows editing of selected items.
14. **Save**—Pushbutton. Saves any changes made in Edit mode.
15. **Left**—Pushbutton. Moves cursor to the left (if any field is there).
16. **Right**— Pushbutton. Moves cursor to the right (if any field is there).
17. **Fine Tune**—Potentiometer with center-detent to adjust IF frequency.
18. **MGC**—Potentiometer to set MGC level when used with AGC switch.
19. **Audio #1**—RCA phone jack. For monitoring Audio #1 output.
20. **Audio #2**—RCA phone jack. For monitoring Audio #2 output.
21. **Audio #3**—RCA phone jack. For monitoring Audio #3 output.

REAR PANEL

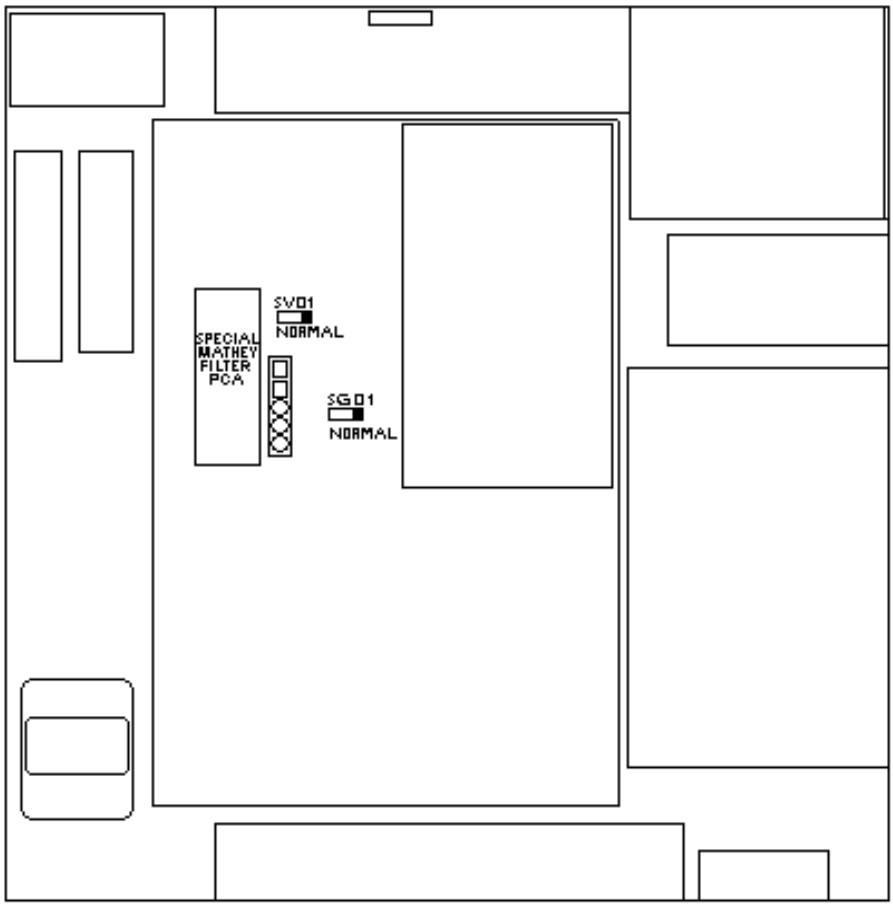


1. **RF Input #1**—F connector. For input from LNB.
2. **RF Input #2**—F connector. For input from LNB.
3. **RF Input #3**—F connector. For input from LNB.
4. **RF Input #4**—F connector. For input from LNB.
5. **IF Loop Out**—F connector provides IF output when required.
6. **IF Loop In**—F connector for IF loop.
7. **Composite Out**—BNC connector female for unfiltered video.
8. **#1 Video Out**—BNC connector female for primary video output.
9. **#2 Video Out**—BNC for auxiliary output. No termination required.
10. **Audio #1 Out**—XLR (3 conductor).
11. **Audio #2 Out**—XLR (3 conductor).
12. **Audio #3 Out**—XLR (3 conductor).
13. **AC Input Voltage Selector**—Two-position slide switch for 120 or 240 VAC.
14. **AC Line Input**—IEC320 connector, with fuse holder.

    NOTE: A ground lug has been provided.

15. **Remote Network Control**—DB-9 connector.
16. **AGC Voltage Out**—Screw terminals (+ and GRD). Proportional to Signal.
17. **NC**—No Connection. Reserved for future use.
18. **AUX Alarm Input**—Screw terminals (+ and GRD). 5 volts maximum.
19. **Relay #1**—Screw terminals (NO, C, NC). Normal state is energized.
20. **Relay #2**—Screw terminals (NO, C, NC). Normal state is energized.

INTERNAL SWITCHES AND OPTIONS



FRONT

1. **SV01**—Two-position slide switch. Baseband Video Inversion switch. (Factory default position shown, adjacent to PCB marking “Normal”).

2. **SG01**— Two-position slide switch. Composite Video Inversion switch. (Factory default position shown, adjacent to PCB marking “Normal”).

These switches invert video at baseband (sync tip up). They compliment the front panel control that provides for inversion at IF. Setting both IF and baseband switches to invert positions will result in non-inverted video output. An example application: Teleports that are re-uplinking may desire inverted IF output and set front panel control as needed. If this is the mode of routine operation, setting SV01 or SG01 to “invert” position provides non-inverted video for local use.

3. **PCA Unit for Mathey Filter**—PC board included to allow future changes in video filtering bandwidth or rolloff.

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CHAPTER 4

INSTALLATION AND SETUP

INTRODUCTION

The MT930B is designed for installation in a standard 19-inch equipment rack. Individual units are rapidly installed and are easy to configure requiring simple tools but no soldering (unless needed for your cables) or external test equipment.

SET INTERNAL SWITCHES FIRST

Before installing a unit in a standard 19-inch equipment rack, make sure all internal switches are set to the positions desired. Chapter 3 illustrates the internal switches that control video inversion and their locations. We expect only limited users may need these switches. All others will need factory default position.

RACK MOUNTING

1. Install the first receiver (if more than one is to be installed) to the position of choice. If a rack is to be full, start with the bottom position and work upward, leaving one rack unit (1¾ in.) between each unit for adequate cooling. The open space may be covered with a blank plate. If other equipment is to be installed, make sure adequate cooling is provided for all equipment within the rack.

    a. Slide the unit into the rack opening.

    b. While holding the unit level, secure the two front mounting brackets with four user-supplied screws and/or washers.

2. See the separate section at the end of the chapter regarding the RS-232C and CONTROL I/O connectors and their use in remote control operation.

CONNECTIONS

1. Connect L-band input(s), up to four, to RF INPUT ports #1, #2, #3, and/or #4 as required. With user editing of the internal satellite database, any port can be used for any input, but we recommend C-band Vertical be connected to #1, C-band Horizontal to #2, Ku-band Vertical be connected to #3, Ku-band Horizontal to #4 to maximize the pre-programmed database which assumes these connections.

The port that is currently selected for L-band input may also output LNB power. Many users have externally powered splitters, and do not desire LNB power output. Menu Group 5 can turn LNB power on or off for the entire receiver. The factory default condition is “LNB power off” (no output).

The satellite and transponder database (Menu Group 2) includes an LNB power field to allow use of dual-polarity LNBF, with two polarities on one port, by selecting low or high LNBF voltage range. Be sure to the global power control in Menu Group 5 “0N” to make these selections effective.

2. Connect video outputs as required. Use COMPOSITE OUTPUT for external descrambler and other applications where high-frequency filtering is not appropriate. Use either Video #1 for primary baseband video output and Video #2 for local monitoring, etc. Video #2 does not need termination.

3. Connect audio outputs as required for this application, using, for example, one if mono, two for stereo, and three for stereo and Secondary Audio Program (SAP).

   NOTE: Audio numbers 2 and 3 include additional bandwidth filtering and de-emphasis that may be required for PAL video systems and compressed audio systems.

4. Connect relay wiring to the quick-disconnect terminal as required. The two relays may be assigned as alarms, timer, C/Ku indicator, H/V indicators.

   NOTE: Confirm alarm is connected properly: relays are energized and fall into de-energized state when triggered or with power loss. When power is applied and no trigger from alarm or timer is present, the contact marked NO will open and the Common will be connected to the NC terminal.

5. Connect an AGC output if desired. This terminal supplies a voltage, references to chassis ground, that is helpful in tuning the dish. A higher voltage indicates less AGC and, therefore, a better input.

6. See the separate section on Remote Control hook-up.

7. Set the rear panel voltage switch to the appropriate local mains (AC power) voltage. Factory default is 115 VAC. Standard Communications has endeavored to supply a power cord appropriate for your application. If a different one is needed, please be sure it meets local safety requirements.

8. Lastly, insert the power cable into the rear of the unit, then into the local 115 VAC or 230 VAC power socket. There is no On/Off power switch.

   The front panel display should be active immediately after power is applied, showing that a receiver self-test has begun.

   See *Chapter 5, Operation*, for operating instructions.

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CHAPTER 5

PRINCIPLES OF OPERATION

This chapter discusses the principles of operation for each MT930B module and circuit. diagrams in Chapter 9 must be used to follow the discussion. Figures 9-1 through 9-3 are especially useful in understanding overall receiver operation.

1ST CONVERTER

The MT930B receiver is equipped with four RF output terminal systems. It is possible to select one of the systems for using relays L101, L102, and L103. When a 950 to 2150 MHz RF input signal is selected, the signal is input to front end module A101 via a bias-tee circuit. A tracking filter, RF automatic gain control (AGC) amplifier, frequency converter, and PLL circuit are built into A101 so an IF signal converted to 479.5 MHz can be output. After passing through helical bandpass filter (BPF) F101, the IF signal is sent to the IF AGC amplifier. Gain reduction for the IF AGC is performed by PIN diode D105. When the RF input level is low, only the RF AGC amplifier in A101 operates, and gain reduction is not performed by the IF AGC amplifier. When the RF input level is high, both AGCs perform gain reduction.

2ND CONVERTER

The converted 479.5 MHz IF signal is input via J401. After the IF signal passes through the low-pass filter (LPF), it is input to Q401–an IC used for frequency conversion. The most important function of Q401 is to convert the 479.5 MHz IF signal to 70 MHz. Q401 also includes a spectrum reversal and AFC functions. The spectrum reversal function is used to reverse video polarity. A local oscillator (LO) is built into Q401. The spectrum of the 70 MHz IF signal is reversed when a 409.5 MHz signal is used as the LO signal. Spectrum reversal is not performed when a C band signal is used.

The LO frequency changes in the range of $\pm$ 2 MHz when an automatic frequency control (AFC) function is used. The 70 MHz signal passes through LPF and buffer amplifier Q403 to J402. The LO signal , after passing through Q403 is input to PLL IC QL01. The comparison frequency used by QL01 is 50 kHz. An error signal is fed back to the LO via LPF Q402.

70 MHZ BPF

70 MHz bandpass filters (BPF)s are inserted between J202 and J203. The insertion loss in this interval is designed to be about 0 dB. It is possible to select six bandwidths (BW)s: 36, 27, 25, 22, 18, or 16 MHz. Two types of filters are provided for the different bandwidths. The 25, 22, 18, and 16 MHz bandwidths use surface acoustical wave (SAW) filters, while the 36 and 27 MHz bandwidths use inductance/capacitance (LC) filters. The reason for using different filters is that optimal characteristics can be obtained for both C band and Ku band.

70 MHZ IF AGC AMPLIFIER

The 70 MHz IF amplifier not only amplifies the 70 MHz IF signal, it divides the signal for use by several circuits. These are the demodulator, prescaler, and level detector circuits.

PRESCALER

The AFC function for the MT930B is performed by counting the IF frequency, using a frequency counter. Q501 is a 1/128th prescaler, while Q502 is a level converter. Output from Q502 is sent to QU08, where the measurement is performed.

IF LEVEL DETECTOR

The 70 MHz IF signal is detected by Schottky barrier diode D521 to calculate the IF level. A single package, D521, is a diode in which several devices are contained. Using Q521 as a differential amplifier improves thermal characteristics. The average value for the IF signal is calculated by providing a large time constant for ½ of Q522.

AGC DRIVER

Two types of AGC voltage are generated here. One for the 1st converter and one for the IF AGC amplifier. When the approximate RF input level is 70 dBm, no gain reduction is done by the 1st converter, but rather, performed by IF AGC amplifier Q201. Because the gain reduction by Q201 becomes nearly completely fixed, if the RF input level is greater than 70 dBm, gain reduction is done by the 1st converter. Q201 gain reduction is activated if the gain reduction by the 1st converter saturates from the RF output level being high.

SIGNAL LEVEL A/D DRIVER

The meter signal for the MT930B connects to the microprocessor via the analog-to-digital (A/D) converter and processed. Q551 determines the optimal voltage range to use as the meter signal, bases on the output voltage from the IF level detector. The output from Q551 is sent to an A/D converter built into microprocessor QU02. The output from Q551 is also supplied to the rear panel AGC terminal.

PHASE-LOCK-LOOP (PLL) DETECTOR

The 70 MHz IF signal is amplified by amplifiers Q251 and Q252, and sent to the double-balance mixer (DBM). The DBM consists of three transformers: D301, D302, and D303. These are used to compare the phase difference between the 70 MHz IF signal and the oscillator output of Q301. Q301 is a voltage-controlled multivibrator. When it oscillates in sync with the 70 MHz IF signal phase, the associated control voltage can be used as demodulated output. After the demodulated output is amplified by Q306, it is split, and sent to the video, audio, and carrier-to-noise (C/N) detect circuits.

C/N RATIO DETECTOR

Although a video signal and audio subcarrier are included in the demodulated output, noise in the 10 MHz region is extracted, using BPFs, and then measured, thus allowing the approximate C/N ratio to be found. Because the extracted noise differs on the 70 MHz BPFs that have been selected, the noise level is compensated by selecting the attenuation level, using D301, D302, and D303. After the noise is amplified by Q602 and Q603, it is converted into a DC voltage by D651. Finally, the noise is compacted by a compression circuit and sent to the A/D converter built into QU02. The reason for the compression is that the noise has a broad dynamic range and is difficult to handle otherwise.

VIDEO DE-EMPHASIS

525-line or 625-line scanning is selected as the de-emphasis network by video switch QV01. The output of QV01 is split for use as both video and composite output. Video switch QG01 is used to select de-emphasis on or off for the composite output.

COMPOSITE LEVEL CONTROL

QG02 is a voltage-control amplifier that allows gain to be varied according to the DC voltage applied to pin 2. Although not normally used, it is possible to reverse the polarity of the composite output signal by switching SG01.

VIDEO LOW-PASS FILTERS

The unit is equipped with a total of five video LPFs: 4.2 MHz, 5.0 MHz, 5.5 MHz, 6.0 MHz, and one that can be added as an option. These filters are driven by video amplifier QV02–QV05, and are the video switches used to select one of the filters.

VIDEO LEVEL CONTROL

QV06 is a video-controlled amplifier (VCA) that allows the gain to be varied according to the DC voltage applied to pin 2. Although not normally used, it is possible to reverse the polarity of the video output signal output by switching SV01.

VIDEO SYNC-SEPARATOR

After the chrominance signal is removed by LPF QM08, it is sent to sync-separator QM09. The back porch output of QM08 is used as a pulse for clamping the back porch. The vertical sync output of QM08 is input to QX01 FPGA, and used for video presence detection.

VIDEO SYNC-TIP CLAMPING

When sync-tip clamping is selected, QM01 and QM02 are turned on during the sync-tip interval, and sync-tip clamping is performed by quickly charging CV24 and CV25.

VIDEO BACK PORCH CLAMPING

When back porch clamping is selected, QM10 is turned on during the back porch interval, and back porch clamping is performed. LV01 and CV26 form a trap to prevent any adverse effect on the burst signal.

VIDEO CLAMPING OFF

When neither sync-tip nor back porch clamping are selected, QV07 is turned on to allow transfer down to extremely low frequencies.

VIDEO BUFFER AMPLIFIER

The MT930B includes three video outputs, each equipped with a buffer amplifier. This is so a short occurring at a given output terminal will not adversely affect the other output terminals.

VIDEO LEVEL CONTROL INTERFACE

QJ03 is capable of producing a stable 1.2 V reference voltage. QJ01 is an 8-bit electric potentiometer capable of driving the reference voltage. QJ02 is a DC level shifter that converts the voltage to that required by QV06 and QG02.

AUDIO IF CONVERTER

The output signal of the 70 MHz detector (including an audio subcarrier) is input to JB01. QB11 and QB71 are frequency-converter ICs. The audio subcarrier can be converted to 10.7 MHz by generating a local 10.7 MHz higher that the desired audio subcarrier, The comparison frequency is 5 kHz.

AUDIO IF FILTER

Audio #1 includes a built-in three-band BPF, while Audio #2 and #3 include built-in five-band BPFs. The 880 kHz BW uses and LC filter, while the 55 kHz BW uses a combination of crystal and ceramic filters. Ceramic filters are used for the other BW filters.

AUDIO DETECTOR

QA11, QA41, and QA71 are FM-detect ICs used to extract the audio signal by detecting the 10.7 MHz audio subcarrier.

AUDIO SLIDING DE-EMPHASIS

Sliding de-emphasis Audios #2 and #3 can be used. Q901 does RMS value detection, while Q902 performs expansion. QE01 is an audio amplifier that performs boosting for level compensation when 110 kHz BW or 55 kHz BW are used.

AUDIO DE-EMPHASIS

It is possible to select one of four types of de-emphasis: 50 μsec, 75 μsec, J17, or Flat. A transistor is used for switching.

AUDIO LEVEL CONTROL

QD31 and QD01 are electric potentiometers, with 8-bit linear resolution used to perform audio level control.

AUDIO OUTPUT AMPLIFIER

Q711, Q741, and Q771 form an amplifier that generates a balanced signal.

AUDIO PHONES AMPLIFIER

Q712, Q742, and Q772 form an amplifier used to drive the phones.

MICROPROCESSOR

QU02 is an IC that controls an 8-bit central processing unit and several interfaces,, but which does not include any read-only memory (ROM). QU04 is a flash ROM. QU05 is a static random access memory device, and QU10 is an editable, electrically programmable ROM (EEPROM). In/Out (I/O) expansion is mainly performed by FPGAs QU08 and QX01. QU09 is a real-time clock, and QU01 is a watchdog and reset circuit. There are also several ICs for address decoding and latching.

COMMUNICATION PORT DRIVER

The unit's rear panel is equipped with a 9-pin D-type subconnector for serial communications. The connector is for use with a personal computer (PC) or other device. It is possible to select the RS-232C or RS-485 standard for serial communications. QY01 is the interface used for RS-232C, while QY02 is that used for RS-485 communications. Because the same connector is used for both standards, an IC disable function and two relays are used so there will be no adverse effects of one type on the other.

METER DRIVER

It is possible to display the signal level, C/N ration, and/or tuning for the unit's moving-coil meter. However, the associated data are processed by microprocessor QU11, which is an 8-bit electric potentiometer that drives the meter by dividing the reference voltage produced by DU08.

DISPLAY

The operational status of the unit is display by using a single liquid crystal display (LCD) panel and 10 light-emitting diodes (LED)s. LCD K002 is driven by LCD driver QR01.

POWER SUPPLY

A tap is built into the primary winding of main transformer T001 in order to handle two types of AC voltage. Three windings are on the secondary side. Winding S1 is used for +15 V, +12 V, –15 V, and +30 V power. Winding S3 is used for the +5 and –5 V supply for analog circuits, and winding S2 is used for the +5 V and

low-noise-block downconverter (LNB) digital power circuits. A switching regulator is used for the +5 V and LNB power supply. A current-limit circuit is included in the LNB supply. Q846 and Q847 turn on if the current passing through R844 becomes large and exceeds the current limit. Q842 configures an R–S flip-flop, and stores the results of overcurrent detection. Although Q843 functions as a switch, it turns off when overcurrent is detected or when LNB power is not being used.

CHAPTER 6

MAINTENANCE

INTRODUCTION

This chapter provides step-by-step procedures for making measurements and adjusting and tuning the MT930B Satellite Receiver. If all steps are followed faithfully, any problems there may be should be solved, and the receiver can be properly aligned. Component sites and adjustment points are in illustrations at the end of this chapter.

PRECAUTIONS

Each of the following must be observed during servicing of the receiver under test (UUT) and/or its options:

1. When making parts changes, always disconnect power to the receiver and ground the body, test equipment, and tools.
2. When replacing or installing wires inside the chassis, make sure there is adequate clearance between the wires and any heat-generating components.
3. When replacing a component that is not soldered to a PC board or plugged into a connector (e.g., the block downconverter, etc.), observe the following procedure:
    a. Strip ¼ inch of insulation from any wire(s) to be connected.
    b. Wrap a wire's center conductor at least one full turn around the center post of any component or solder terminal to which the wire is being attached.
    c. Properly heat the connection and apply solder appropriately. Insulate as necessary.

RECOMMENDED TEST EQUIPMENT

The maintenance described in this chapter requires special test equipment (or equivalent). Equipment listed in Table 6-1 is what SCC uses.

NOTE: Locations of various components and adjustment points can be found in illustrations at the end of this chapter

Table 6-1. Recommended Test Equipment

Equipment	Manufacturer/Model
1 dB Step Attenuator (2)	TRA604-D
4 GHz Low-Noise Amplifier	SCC LNBC-24A
Video Measurement Set	Tek VM-700A
Network Analyzer	Avantest R3762A
SWR Meter	HP or Wilton
Frequency Counter	HP 5351B
Satellite Test Set (Video Ex-	Harris FV40
Signal Generator	TEK TG-7
Spectrum Analyzer	Tek 492
TV Test Signal Generator (PAL)	Tek TAG-271
Digital Signal Generator	Tek 1910
20 VDC Power Supply	Lambda
DC Block (2)	DCB24A
DC Voltmeter	Fluke 77
Oscilloscope	Tek 2465B
LNBC	SCC 24A
Line Amplifier	SCC LA24
50Ω–75Ω Converter (2)	Generic
Local Oscillator	950 to 2150 MHz
Video Monitor 625-Line (PAL)	Sony
Video Monitor 525-Line (NTSC)	Sony

MEASUREMENTS

RF MEASUREMENTS

RF Input Level Measurement

Measurement Conditions:

- Set up the equipment as in Figure 1.
- Input: J101, J102, J103, or J104 at 950, 1210, 1700 MHz (75 Ω)
- Output: Video output
- AFC: ON
- AGC: ON
- RF input level: –20 to –65 dBm

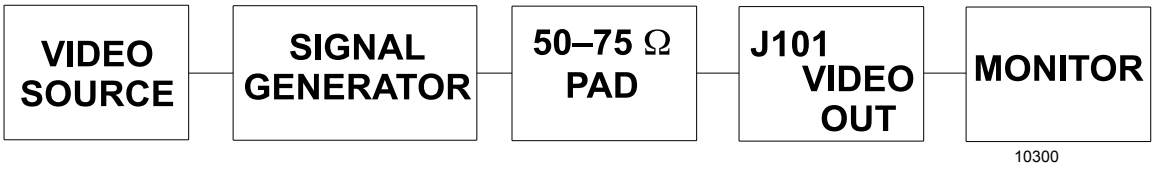

Figure 6-1. Equipment Setup for Measurement

Measurement Procedure:
Vary the received frequency to 950, 1210, and 2150 MHz, lower the signal generator input level, and measure the input level at each frequency that occurs just before noise appears on the TV monitor. Take the three worst readings as the measured values.

Measurement Specification:
– RF Input Level: –20 to –65 dBm

Input Return Loss Measurement

Measurement Conditions:
- Use an Advantest R3762A vector analyzer for this measurement.
- Insert a DC block between the test terminal and the vector analyzer or make sure the LNB is off, before making connections.
- Input: J101, J102, J103, J104; 950 to 2150 MHz at –10 dBm (75 Ω)
- MGC: MAX

Measurement Procedure:
Set the input switch to 1 through 4 in turn, connect the vector analyzer to the appropriate input pin (J101 through J104), and measure the return loss.

Measurement Specification:
– Input Return Loss: ≥ 12 dB

Input Isolation Measurement

Measurement Conditions:

- Set the equipment up as in Figure 6-2.
- Input: 950 to 2150 MHz –10 dBm (75 Ω)

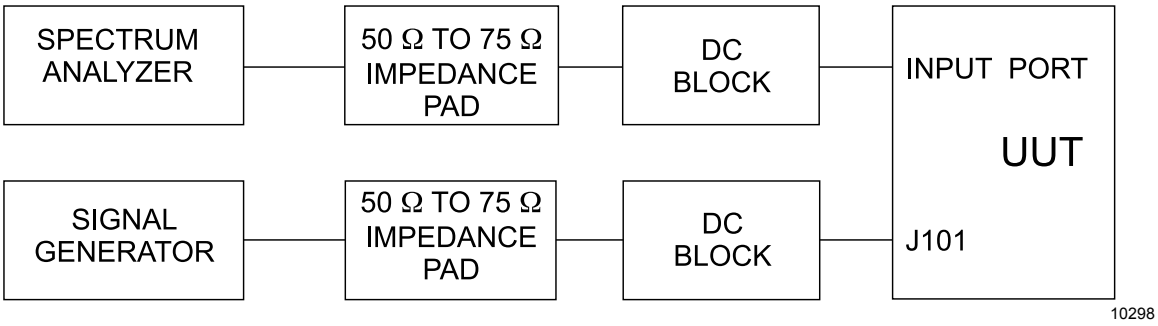

Figure 6-2. Equipment Setup for Input Isolation Measurement

Measurement Procedure:

1. Make sure the front panel RF port is set to 1.
2. When connecting 1 to 4, read at 3 and 4; connecting 2 to 1, read between 3 and 4, connecting 3 to 1, read between 2 and 4; connecting 4 to 1, read between 2 and 3.
3. Connect the signal generator to RF Input port #1, and measure the leakage to ports 2 through 4. The amount should be the reference level (–10 dBm) minus the leakage signal level.
4. Use the worst reading as the measured value. Note that there is a tendency for the worst measured value to appear near 1.8 or 2.1 GHz.
5. Measure the isolation of ports 2–4 as in steps 1 through 3

Measurement Specification:

– Input Isolation (950 to 2150 MHz): ≥ 40 dB

Noise Figure Measurement

Measurement Conditions:

- Set the equipment up as in Figure 6-3.
  - Start: 50 MHz
  - Stop: 90 MHz
  - Step size: 2 MHz
  - LO (local oscillator) frequency (3.1 SP): Receiving frequency + 70 MHz (set each time the channel is changed)
  - Measurement mode: 1.4 SP. (external fixed LO)
  - Loss compensation: ON (34.1 SP)
  - Noise source – greatest loss between UUTs (34.2 SP): 6.0 dB
  - Absolute temperature of object having loss (34.3 SP): 300 ◦K (273◦ + room temperature). Loss between meter (34.4 SP): 6 dB (perform calibration in NF and gain (measurement mode)
- MGC: Max, AFC OFF
- AFC: ON, AGC OFF
- MGC: MAX
- Test frequencies: 950, 1250, 1500, 2150 MHz

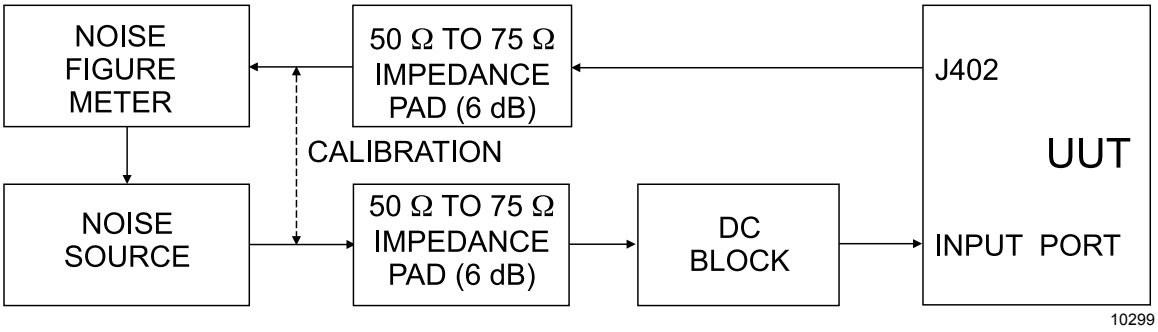

Figure 6-3. Noise Figure Gain Variation Equipment Setup

Measurement Procedure:

1. Calibrate the equipment after inputting the LO data (receive frequency + 70 MHz). It will not be necessary to recalibrate for each frequency.
2. Connect the UUT, set the receive frequency, and read the NF (noise figure) value at 70 MHz.
3. Use the worst reading as the measured values. Note that there is a tendency for the worst measured value to appear near 2.0 GHz.
4. Change the test frequency, update the LO data, and measure NF at each frequency.

Measurement Specification:

– Noise Figure: ≤ 15 dB

Gain Variation Measurement

Measurement Conditions:

- Use the same connections as for Noise Figure Measurement, above.
- AFC: ON
- AGC: OFF
- MGC: Max.

Measurement Procedure:

Vary the LO data of the noise figure meter and the receive frequency, and take the MAX minus MIN value for NF meter gain as the measured value. Note that there is a tendency for the maximum value to appear at about 950 MHz, and for the minimum value to show up around 2.0 GHz.

Measurement Specification:

– Gain Variation: $\leq$ 8 dB

Image Rejection for 1st IF Measurement

Measurement Conditions:

- Input: 950, 1250, 1500, 2150 MHz at –30 dBm (75 Ω)
- Output: 70 MHz IF TEST (75 Ω)
- AFC: OFF
- AGC: OFF
- MGC: OFF (–30 dBm Ref.)

Measurement Procedure:

1. Set the UUT and the signal generator to the receive frequency.
2. Connect the spectrum analyzer to 70 MHz IF TEST.
3. Set the output level to –30 dBm, using the MGC. The output level is the reference level.
4. Measure the 70 MHz output level when the signal generator frequency is the same as the image frequency (the MGC is set as in step 3). See below.
5. The reading in step 4, minus the reading at step 3 is the image rejection. Image Frequency = Receiving frequency + (2 x 1st IF) = Receive Frequency + 959 MHz, and Receiving frequency + (½ x 1st IF [612]) = Receive Frequency + 239.75 MHz

Measurement Specifications:

– Image rejection (for 1st IF): $\geq$ 30 dB

IM3 (–25 dBm Input) Measurement

Measurement Conditions:

- Input: J101, J102, J103, or J104 at –25 dBm (75 Ω)
- Output: 70 MHz IF TEST (75 Ω)
- AFC: OFF
- MGC: OFF (–30 dBm Ref.)

Measurement Procedure:

1. Set the UUT and the signal generator to 950 MHz.
2. Adjust the input level so 70 MHz IF TEST is –30 dBm when the input level is –25 dBm, and take this value as the reference.
3. Input signals of 990 MHz and 1030 MHz at –25 dBm, and measure the IF TEST level when the receive frequency is set to 950 and 1070 MHz. Each IM3 reading is step 2 minus step 3.
4. Use the value obtained when inputting 1500 MHz at –25 dBm as the reference, and measure the IM3 appearing at 1380 and 1500 MHz when two signals at 1420 and 1460 MHz are input at –25 dBm.
5. Use the value obtained when inputting 1750 MHz at –25 dBm as the reference, and measure the IM3 appearing at 1630 and 1750 MHz when two signals at 1670 and 1710 MHz are input at –25 dBm.
6. Use the value obtained when inputting 2150 MHz at –25 dBm as the reference, and measure the IM3 appearing at 2030 and 2150 MHz when two signals at 2070 and 2110 MHz are input at –25 dBm.
7. Take the worst readings obtained in steps 3 through 6 as the measurements.

Measurement Specification:

– IM3 (–25 dBm Input): ≥ 50 dBc

RF Input LO Leakage Measurement

Measurement Conditions:

- Set the equipment up as in Figure 6-4.
- MGC: Maximum gain

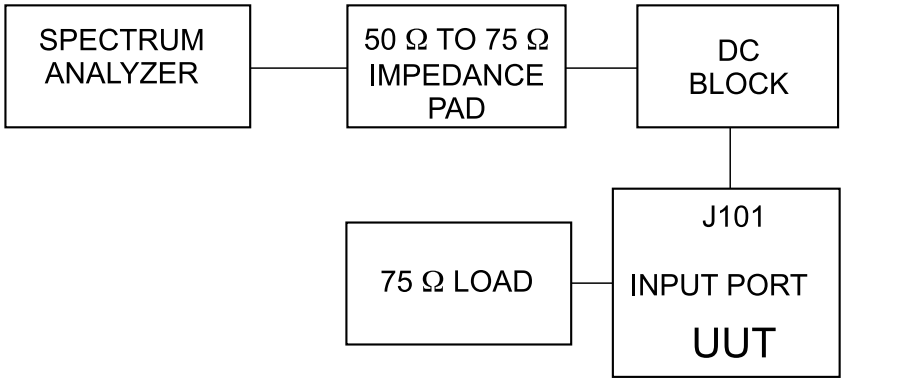

Figure 6-4. LO Leakage RF Input Equipment Setup

Measurement Procedure:

1. Connect the spectrum analyzer to J101.
2. Connect a 75 Ω load to J102 through J104.
3. Set the input port to #1.
4. Vary the spectrum analyzer frequency from 900 to 2200 MHz, and measure the spurious modulation level as the receiver frequency is varied from 950 to 2159 MHz.
5. Vary the spectrum analyzer frequency from 3.7 to 4.3 GHz, and measure in the same manner.
6. Take the worst value as the measured value for local leakage at RF input (at 0.9 to 2.2 GHz and 3.7 to 4.2 GHz).
7. Vary the test frequency from 0 to 20 MHz, 20 to 900 MHz, 2.2 to 3.7 GHz, and 4.32 GHz and higher, and measure spurious modulation level for each of these settings as the receiver frequency is varied from 950 to 2150 MHz.
8. Take the worst value as the measured value for local leakage at RF input (all frequencies except –10).
9. Set the input port to 2 through 4, and repeat steps 4–8 for each port, connecting 75 Ω loads to the other ports.

Measurement Specifications:

LO Leakage
At 0.9 to 2.2 GHz and 3.7 to 4.2 GHz: $\leq$ –55 dBm
At all frequencies except the above: $\leq$ –45 dBm
As a convenience, a leakage test chart is at the end of this chapter. Feel free to duplicate it and use it.

LNB Power Voltage Measurement (@ RF Input Connector)

Measurement Conditions:

- LNB: ON (13 V or 18 V)
- Terminals: J101, J102, J103, or J104

Measurement Procedure:

1. Set the LNB to 18 V.
2. Connect a 75 Ω load to J101, and set the load so the current is 500 mA.
3. Measure the LNB voltage at J101 (High 500 mA).
4. Set the LNB to 13 V.
5. Connect a 75 Ω load to J101, and set the load so the current is 300 mA.
6. Measure the LNB voltage at J101 (Low 300 mA).

Measurement Specification:

– LNB Power Voltage:
  - High 500 mA: ≥ 18.0 <20.0 V
  - Low 300 mA ≥ 12.7 <14.0 V

LNB Trip Current Measurement

Measurement Conditions:

- LNB: ON, 18 V
- Terminals: J101, J102, J103, or J104

Measurement Procedure:

1. Set the LNB to 18 V.
2. Connect a 75 Ω load to J101
3. Raise the load current by varying the load, and measure the current value when the LNB voltage flickers.

Measurement Specification:

– LNB Trip Current: ≥ 500 mA, ≤ 800 mA

IF MEASUREMENTS

First IF Bandwidth at –3 dB

Measurement Conditions:

- Use a scalar network analyzer.
- Input: J101, J102, J103, or J104, 1210 MHz at –35 dBm (75 Ω)
- Output: J105 (50 Ω at 479.5 MHz)
- AFC: OFF
- AGC: OFF
- MGC: 70 MHz IF TEST at –30 dBm (IF position)

Measurement Procedure:

While the center level is 1210 MHz, measure the upper and lower frequencies where –3 dB results. The difference between the two frequencies is the 1st IF bandwidth.

Measurement Specification:

– Bandwidth at –3 dB: ≥ 40 MHz

Second IF Image Rejection Measurement

Measurement Conditions:

- Input: J101, J102, J103, or J104, 2150 MHz at –30 dBm (75 Ω)
- Output: 70 MHz IF TEST
- AFC: OFF
- AGC: OFF
- MGC: 70 MHz IF TEST at –30 dBm (IF position)

Measurement Procedure:

1. Set the VIDEO OUT setting to Ku, NOR (or C, INV). (2nd LO: 549.5 MHz)
2. Set the UUT and signal generator to the frequency to be measured.
3. Set the 70 MHz IF level to –30 dBm, using the MGC. This level is the reference level.
4. Set the signal generator to the image frequency, and read the 70 MHz IF output level (the MGC is set the same as in step 3).
   The difference in level between step 3 and 4 is the image rejection.
   (2nd IF = 70 MHz)
   Image Frequency = Receive Frequency + (½ x 2nd IF) = Receive Frequency + 274.75 MHz
   Receive Frequency + (2 x 2nd IF) = Receive Frequency + 1099 MHz

Measurement Specification:

– 2nd IF Image Rejection: ≥ 30 dBm

Second IF Bandwidth (–3 and –25 dB) Measurement

Measurement Conditions:

- Use the network analyzer.
- Input: 70 MHz IF LOOP IN (75 Ω), 70 ± 50 MHz, –30 dBm
- Output: 70 MHz IF TEST (75 Ω)
- AFC: OFF
- AGC: OFF
- MGC: –30 dBm for 70 MHz IF TEST

Measurement Procedure:

1. Take the 70 MHz output level as the reference, and measure the frequency bandwidth for –3 dB and – 25 dB.
2. Measure the frequency that is 3 dB below the level in step 1. Measure each separate filter (16, 18, 22, 25, 27, and 36 MHz)

Measurement Specifications:

–	16 MHz Bandwidth:	–3 dB Bandwidth:	16 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 26.5 MHz
–	18 MHz Bandwidth:	–3 dB Bandwidth:	18 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 26.5 MHz
–	22 MHz Bandwidth	–3 dB Bandwidth:	22 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 34.0 MHz
–	25 MHz Bandwidth	–3 dB Bandwidth:	25 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 37.0 MHz
–	27 MHz Bandwidth	–3 dB Bandwidth:	27 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 50.5 MHz
–	36 MHz Bandwidth	–3 dB Bandwidth:	36 ± 1.0 MHz
		–25 dB Bandwidth:	≤ 60.5 MHz

Spurious (by Second IF) Measurement

Measurement Conditions:

- Input: 70 MHz IF LOOP IN, 950 to 2150 MHz at –20 to –65 dBm (75 Ω)
- Output: 70 MHz IF TEST
- AFC: ON
- AGC: ON

Measurement Procedure:

1. Set the VIDEO OUT setting to Ku, NOR (or C, INV). (2nd LO: 549.5 MHz)
2. Vary the UUT and signal generator frequency from 950 to 2150 MHz, and similarly vary the receive frequency of the unit.
3. Watch the 70 MHz IF, and read the level difference between the desired signal and the spurious modulation at $\pm$ 20 MHz.
4. Set the VIDEO OUT setting to Ku, NOR (or C, INV). (2nd LO: 409.5 MHz).
5. Vary the UUT and signal generator frequency from 950 to 2150 MHz, and similarly vary the receive frequency of the set.
6. Watch the 70 MHz IF, and read the level difference between the desired signal and the spurious modulation at $\pm$ 20 MHz.

NOTE: There is a tendency for spurious modulation to appear at 1228.5 MHz, 1638 MHz, and 2047.5 MHz

Measurement Specification:

Spurious (by 2nd IF): $\leq$ –30 dB

AGC Range for Minimum Input Level Measurement

Measurement Conditions:

- Input signal: 1210 MHz
- Video modulation: None
- AFC: ON
- AGC: ON

Measurement Procedure:

1. Check that 70 MHz IF TEST is –30 dBm when the input is 1210 MHz at –30 dBm.
2. Take as the measured level the level at which the 70 MHz output level goes from –30 dBm to –31dBm).

Measurement Specification:

AGC Range for Minimum Input Level: $\leq$ –65 dBm

FM Dynamic Threshold C/N Measurement

Measurement Conditions:

- Input signal: 1210 MHz, –30 dBm
- Output Terminal: VIDEO OUT
- Video Modulation: Color bars, 24.0 MHz p-p (peak-to-peak)
- Pre-emphasis: 625
- System switch: 625
- The C/N must be calibrated.

Measurement Procedure:

Adjust the variable noise attenuator, and read the attenuator value just after noise begins to appear on the TV monitor. Take the C/N value at this time as the measured value.

Measurement Specification:

FM Dynamic Threshold C/N: $\leq$ 13.5 dB

FM Static Threshold C/N Measurement

Measurement Conditions:

- Video Modulation Ratio: 50% pedestal, 24.0 MHz p-p
- Pre-emphasis: 625
- System: 625
- VM-700 connections: EXT SYNC terminal connected to test signal
- VM-700 settings:
- WAVEFORM → MENU → SYNC → External Sync

Measurement Procedure:

1. Vary the noise attenuator in 1 dB steps, and draw a graph of C/N vs. S/N as in Figure 6-6.
2. The C/N value that is 1 dB below the S/N line is the result.

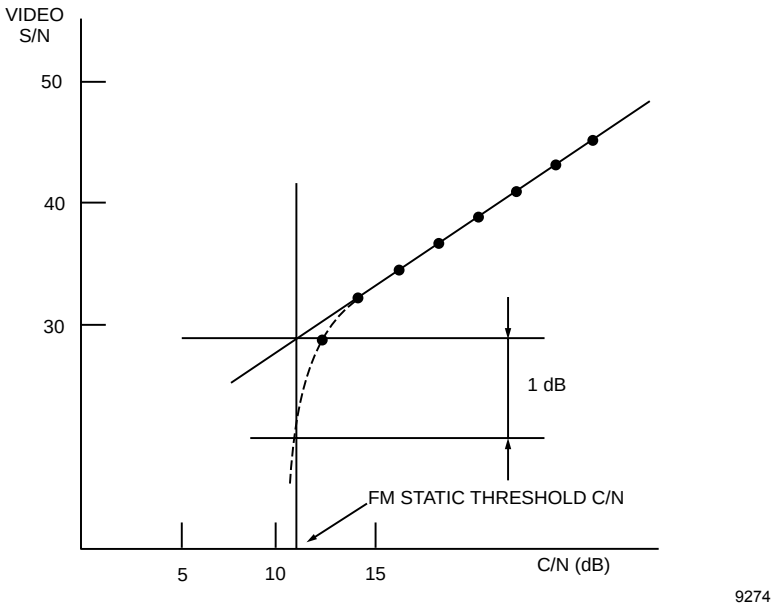

Figure 6-5. Measuring FM Static Threshold

Measurement Specification:

FM Static Threshold C/N: $\leq$ 8.5 dB

IF Output Level and Frequency Measurement

Measurement Conditions:

- Input: 950 to 2150 MHz at –20 to –65 dBm (75 Ω)
- Output: 70 MHz IF TEST
- AFC: ON (Fine tune VR: Center detent position)
- AGC: ON

Measurement Procedure:

1. Measure the 70 MHz IF output level with the spectrum analyzer. This is the IF output test level.
2. Measure the 70 MHz IF output frequency with the frequency counter. This is the IF test point output frequency.

Measurement Specifications:

IF TEST Output Level: –30 dBm ± 2.0 dB
IF TEST Output Frequency: 70 ± 0.1 MHz

Overall 20 MHz Bandwidth Ripple Measurement

Measurement Conditions:

- Measure with the scalar network analyzer.
- Input: 950 to 2150 MHz at –20 to –65 dBm (75 Ω)
- Output: 70 MHz IF TEST
- AFC: OFF
- AGC: OFF
- MGC: 70 MHz IF (the point where the IF output becomes –30 dBm)

Measurement Procedure:

1. Vary the signal generator center frequency from 950 to 2150 MHz , and set the test frequency of the UUT to the center frequency of the signal generator. Verify that the frequency has the largest ripple at center frequency ± 10 MHz.
2. Measure the ripple of the center frequency ± 10 MHz at the frequency with the largest amount of ripple (represented as a ± value when the center frequency is taken as 0 dB).

Measurement Specification:

Overall 20 MHz Bandwidth Ripple: ≤ ± 2.0 dB

IF Loop Level Measurement (RF Input –30 to –50 dBm)

Measurement Conditions:

- Input: 1210 MHz (unmodulated) at –30 to –50 dBm (75 Ω)
- Output: IF LOOP OUT
- AFC: OFF
- AGC: OFF
- MGC: 70 MHz IF (the point where the IF output becomes –30 dBm)

Measurement Procedure:

1. Input 1210 MHz at –30 to – 50 dBm from the signal generator, and adjust the MGC so –30 dBm is read at the 70 MHz IF TEST terminal.
2. Connect the spectrum analyzer to the IF LOOP OUT terminal, and measure the 70 MHz level and frequency.

Measurement Specifications:

- IF Loop Level: -30 ± 2.0 dBm
- IF Loop Frequency: 70 ± 0 MHz

VIDEO AUTOMATIC MEASUREMENTS

Measurement Conditions 525 (NTSC):

- Frequency: 1210 MHz at –30 dBm
- Pre-emphasis: 525
- Video modulation: 18.4 MHz p-p
- Receive frequency: 1210 MHz
- METER SELECT: TUNE
- IF BANDWIDTH: 36
- AFC: ON
- AGC: ON
- VIDEO: 525
- VIDEO BANDWIDTH: 4.2
- DE-EMPH: ON
- RF INPUT: 1
- VIDEO INVERSION: Ku, NOR
- LNB POWER: OFF
- VIDEO: COMPOSITE OUT
- VIDEO SIGNAL OUTPUT: COMPOSITE OUT
- VIDEO OUT: #1

Measurement Conditions 625 (PAL):

- As for 525 (NTSC), but change the following:
- Pre-emphasis: 625
- Video modulation: 24.0 MHz p-p
- VIDEO switch: 625
- VIDEO BANDWIDTH switch: 5.5

Measurement Procedure (Automatic):

Make the following measurements with the VM-700 in AUTO mode:

- Line-Time Distortion
- Short-Time Distortion (NTSC)
- Pulse/Bar Ratio (PAL)
- Video S/N (C/N > 25 dB)
- Luminance Nonlinearity
- Chrominance–Luminance Intermodulation
- Field-Time Distortion

Measurement Procedure (Manual):
Make the following measurements with the VM-700A in MANUAL mode:

- Chrominance–Luminance Delay
- Chrominance–Luminance Gain
- Differential Gain (at 10–90% APL)
- Differential Phase (at 10–90% APL)
- Gain Frequency Distortion (Multiburst)
- Chrominance Nonlinear Gain
- Chrominance Nonlinear Phase
- Video S/N (C/N = 15.5 dB)

Measurement Specifications:
Refer to *Chapter 2, Specifications*, for all data.

Frequency Response Measurement (Composite Out 525/625)

Measurement Conditions:

- Video test signal: U704 video sweep (TG-7)
- Test equipment: Oscilloscope

Measurement Procedure:
Observe the video sweep wave on the oscilloscope, and measure the frequency for the frequency given in the specifications, and convert the measurement to dB.

Measurement Specifications:
Frequency Response NTSC:

- 0.1 Hz to 6 MHz: ± 1.0 dB
- 6 MHz to 10 MHz: ± 3.0 dB

Frequency Response PAL:

- 0.1 Hz to 8 MHz: ± 1.0 dB
- 8 MHz to 10 MHz: ± 3.0 dB

Deviation Range for 1 V p-p Output Measurement

Measurement Procedure:

1. Set the video level to zero, and measure the video modulation when the output waveform is 1 V p-p (maximum deviation range).
2. Set the video level to 100.0, and measure the video modulation when the output waveform is 1 V p-p (minimum deviation range).

Measurement Specification:
Deviation Range for 1 V p-p Output:

- 10.0 to 27.6 MHz p-p (NTSC)
- 9.0 to 24.0 MHz p-p (PAL)

Dispersal Rejection (Sync Tip) Measurement

Measurement Conditions:

- Energy: MHz p-p
- Clamp: Sync-tip
- Video source: Color bar
- VM-700: Two-field
- Video inversion: KU, NOR
- Energy Dispersal: 30 Hz

Measurement Procedure:

1. Connect the VM-700 to the unit COMPOSITE OUT terminal.
2. Set to TWO FIELD, and measure dispersal width A as shown in Figure 6-7.

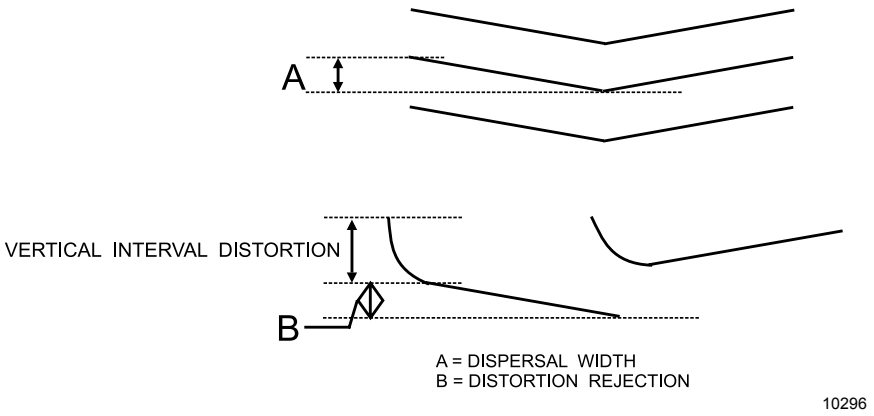

Figure 6-6. Measuring Dispersal Rejection

3. Connect the VM-700 to the VIDEO OUT terminal.
4. Set to TWO FIELD, and measure the dispersal width in the same manner as above (do not measure the vertical interval distortion component).
5. Using the measured values for A and B in Figure 6-7, take the result calculated by the formula below as the dispersal rejection:
   Dispersal Rejection = 20 Log (B÷A) dB

Measurement Specification:

Dispersal Rejection (Sync Tip): ≥40 dB

Vertical Interval Distortion Measurement

Measurement Conditions:
- Clamp: Sync-tip
- VM-700: TWO FIELD

Measurement Procedure:
See Figure 6-8, measure the values for the vertical sync signal of the output waveform, and measure, using 100 IRE (525-NTSC) or 100% (625-PAL) as the reference.

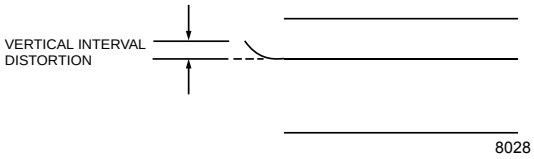

Figure 6-7. Measuring Vertical Interval Distortion

Measurement Specification:
Vertical Interval Distortion:
- ≤ 2.0 IRE (NTSC)
- ≤ 2.0% (PAL)

#2 Video/Video Test Output Measurement

Measurement Procedure:
Measure the outputs of #2 video/video test output, and compare them with the output level of #1 video output.

Measurement Specification:
– #2 Video/Video Test output level: ± 1.0% (reference #1 video output)

70 MHz IF Signal Leakage Measurement

Measurement Conditions:
- Input signal: 1210 MHz at –30 dBm
- Video modulation: None

Measurement Procedure:
Connect the spectrum analyzer to the composite out, #1/#2 video out, and video test terminals, and measure the 70 MHz leakage.

Measurement Specification:
— 70 MHz IF Signal Leakage:
- ≤ –50 dBm (Composite Out)
- ≤ –65 dBm (#1/#2 Video Out and Video Test Out)

TUNING MEASUREMENTS

Set up the equipment as in Figure 6-8.

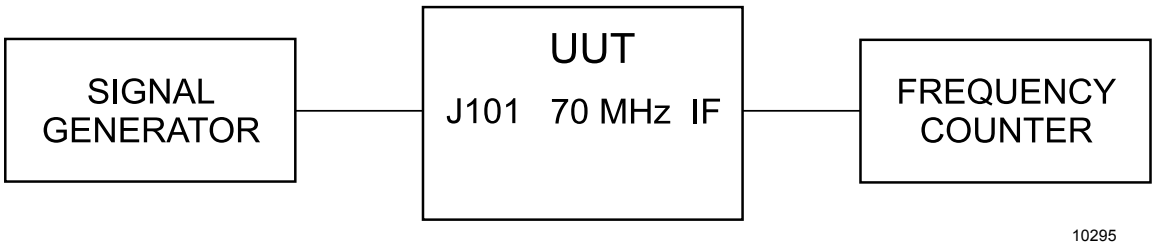

Figure 6-5. Tuning Measurement Equipment Setup

AFC Range Measurement

Measurement Conditions:

- Frequency: 1210 MHz, –30 dBm
- AFC: ON

Measurement Procedure:

1. Confirm that the output frequency at 70 MHz TEST OUT is 70 MHz ± 100 kHz.
2. Change the input signal to 1212 MHz.
3. Confirm that the output frequency at J041 is 70 MHz ± 100 kHz.
4. Change the input signal to 1208 MHz.
5. Confirm that the output frequency at J041 is 70 MHz ± 100 kHz.
6. Set AFC to OFF.
7. Repeat steps 1 through 5, but confirm that the output frequency at J041 is 70 ± 2 MHz.

Measurement Specification:

AFC Range: ± 2.0 MHz

Fine Tuning Range Measurement

Measurement Procedure:

1. Perform all steps with the AFC switch in both ON and OFF positions.
2. Measure the output frequency at 70 MHz TEST OUT.
3. Rotate the FINE TUNE control fully CCW, measure the output frequency at J041, and calculate this figure minus the frequency in step 2.
4. Rotate the FINE TUNE control fully CW, measure the output frequency at J041, and calculate this figure minus the frequency in step 2.

Measurement Specification:

Fine Tuning Range: ± 2.0 MHz

AGC Measurement

Measurement Conditions:

- Measurement terminal: Rear panel AGC terminal (JW05)
- Connection resistance: Connect a 10 k ohm resistor between the + and – AGC terminals.

Measurement Procedure:

1. Set the AGC control to OFF (MGC).
2. Measure the voltage at the AGC terminals when the MGC control is set to minimum.
3. Measure the voltage at the AGC terminals when the MGC control is set to maximum.

Measurement Specification:

– AGC output range: ± 0 (control set to minimum) ± 5 V (control set to maximum)

Audio Frequency Response Measurement

Measurement Procedure:

1. Set the FM signal generator as follows, and the input to JB01:
   a. Carrier frequency: 6.8 MHz
   b. Output level: –9 ± 1 dBm
   c. Frequency Deviation:
      i. ± 400 kHz p-p (BW 880 kHz)
      ii. ± 200 kHz p-p (BW 440 kHz)
      iii. ± 100 kHz p-p (BW 330 kHz, 220 kHz)
      iv. ± 50 kHz p-p (BW 150 kHz, 110 kHz)
      v. ± 25 kHz p-p (BW 55 kHz)
2. Set the audio subcarrier frequency to 6800 kHz, and connect rear panel AUDIO #1, #2, or #2 to the audio analyzer.
3. Select the appropriate audio BW, and set the frequency deviation according to step 1,c.
4. Set the modulation frequency to 100 Hz, and adjust the level so the rear panel audio output is 18 ± 0.1 dB.
5. Select the appropriate audio de-emphasis for other than J17, take the output level when the modulation frequency is set to 100 Hz, and find the deviation in Table 6-2. Calculate the difference compared to the standard de-emphasis curve for 50 μsec or 75 μsec.

6. For J17 audio de-emphasis, adjust the level to 8 ± 1 dB at 1420 Hz.
7. Use the result as a reference, and find the deviation from J17.

Table 6-2. De-emphasis Deviation

	400	700	1 k	1.5 k	2 k	3 k	4 k	5 k	6 k	8 k	10 k	12 k	15 k
50 μsec	–0.08	–0.20	–0.41	–0.87	–1.44	–2.76	–4.11	–5.40	–6.58	–8.64	–10.37	–11.84	–13.64
75 μsec	–0.15	–0.45	–0.87	–1.76	–2.76	–4.78	–6.58	–8.16	–9.53	–11.84	–13.64	–15.19	–17.08

	50	200	400	800	1.42 k	2 k	4 k	6.4 k	8 k	10 k	15 k
J17	9.40	8.76	7.18	3.80	0	–2.32	–6.20	–7.81	–8.29	–8.62	–8.99

Use 100 Hz as the reference for 50 μsec and 75 μsec.
Use 1.42 kHz as the reference for J17.

Audio Output Level Measurement

Measurement Procedure:

1. Set the FM signal generator as follows, and input to JB01:
    a. Carrier frequency: 6.8 MHz
    b. Output level: –9 ± 1 dBm
    c. Frequency Deviation:
        i. ± 400 kHz p-p (BW 880 kHz)
        ii. ± 200 kHz p-p (BW 440 kHz)
        iii. ± 100 kHz p-p (BW 330 kHz, 220 kHz)
        iv. ± 50 kHz p-p (BW 150 kHz, 110 kHz)
        v. ± 25 kHz p-p (BW 55 kHz)
    d. Modulation frequency: 1 kHz
2. Set the audio subcarrier frequency to 6800 kHz, level to 100.0, de-emphasis to FLAT, and connect the audio analyzer to rear panel AUDIO #1, #2, or #3 to measure the output level.

Audio Higher Harmonic Distortion Measurement

1. Set the FM signal generator as follows and input to JB01:
    a. Carrier frequency: 6.8 MHz
    b. Output level: –9 ± 1 dBm
    c. Frequency Deviation:
        i. ± 400 kHz p-p (BW 880 kHz)
        ii. ± 200 kHz p-p (BW 440 kHz)
        iii. ± 100 kHz p-p (BW 330 kHz, 220 kHz)
        iv. ± 50 kHz p-p (BW 150 kHz, 110 kHz)
        v. ± 25 kHz p-p (BW 55 kHz)
    d. Modulation frequency: 1 kHz
2. Set the audio subcarrier frequency to 6800 kHz and set the de-emphasis appropriately and connect the audio analyzer to rear panel AUDIO #1, #2, or #3, adjust the output level to 18 dBm, and measure the distortion.

Audio Hum and Noise Measurement

Measurement Procedure:

1. Set the FM signal generator as follows and input to JB01.
    a. Carrier frequency: 6.8 MHz
    b. Output level: –9 ± 1 dBm
    c. Frequency Deviation:
        i. ± 400 kHz p-p (BW 880 kHz)
        ii. ± 200 kHz p-p (BW 440 kHz)
        iii. ± 100 kHz p-p (BW 330 kHz, 220 kHz)
        iv. ± 50 kHz p-p (BW 150 kHz, 110 kHz)
        v. ± 25 kHz p-p (BW 55 kHz)
    d. Modulation frequency: 1 kHz
2. Set the audio subcarrier frequency to 6800 kHz and set the de-emphasis appropriately and connect the audio analyzer to rear panel AUDIO #1, #2, or #3, adjust the output level to 18 ± 1 dBm, and record the reading as the reference level.
3. Turn off modulation, and find the difference from the level in step 2.

Audio Channel Separation Measurement

1. Use an FM signal generator capable of two-wave output.
2. Set the FM signal generator as follows and input to JB01.
    a. Carrier frequency: 6.8 MHz (channel generating crosstalk)
    b. Output level: –9 ± 1 dBm (channel receiving crosstalk)
    c. Frequency Deviation:
        i. ± 400 kHz p-p (BW 880 kHz)
        ii. ± 200 kHz p-p (BW 440 kHz)
        iii. ± 100 kHz p-p (BW 330 kHz, 220 kHz)
        iv. ± 50 kHz p-p (BW 150 kHz, 110 kHz)
        v. ± 25 kHz p-p (BW 55 kHz)
    d. Modulation frequency: 100 Hz, 1 kHz, 10 kHz (BW 55 kHz: 7.5 kHz)
3. Set the de-emphasis to FLAT at the time of a, b, or c, EXPAND at the d or e., and set the audio subcarrier frequency for each of the two channels to be measured. Detune (e.g., set to 9000 kHz) any channels not being used.
4. Adjust the output level of both channels being measured to 4 ± 1 dBm, and record the reading as the reference level.
5. Turn off modulation for the channel receiving crosstalk, and find the difference from the level in step 4.

Audio Minimum Input Level Measurement

Measurement Procedure:

1. Set the FM signal generator as follows and input to JB01.
   a. Carrier frequency: 6.8 MHz (channel generating crosstalk)
   b. Output level: –9 ± 1 dBm (channel receiving crosstalk)
   c. Frequency Deviation: ± 50 kHz p-p (BW 150 kHz, 110 kHz)
   d. Modulation frequency: 1 kHz
2. Set the audio subcarrier frequency to 6800 kHz and the de-emphasis to 75 μsec, and connect the audio analyzer to rear panel AUDIO #1, #2, or #3, adjust the output level to 18 ± 1 dBm, and record the reading as the reference level.
3. Turn off modulation, and measure hum and noise. Gradually reduce the FM signal generator output level, and find the input level at JB01 where the measured value reaches the specified value of –68 dB.

CHECKS AND ADJUSTMENTS

RF Module AGC Properties Adjustment

Adjustment Procedure:

1. Adjust R109 so the voltage at TP01 is 2.2 V.
2. At this time, verify that the voltage at R108 is 5 V.

RF MODULE CHECKS AND ADJUSTMENTS

RF Module Frequency Response Check

Check Conditions:

- Input: J101, J102, J103, or J104 (75 Ω)
- Output: J105 (50 Ω); –35 dBm
- AFC switch: OFF
- AGC switch: OFF
- MGC: At a position corresponding to –35 dBm at J105

Check Procedure:

1. After correcting the scalar network analyzer, connect as shown in Figure 6-9.

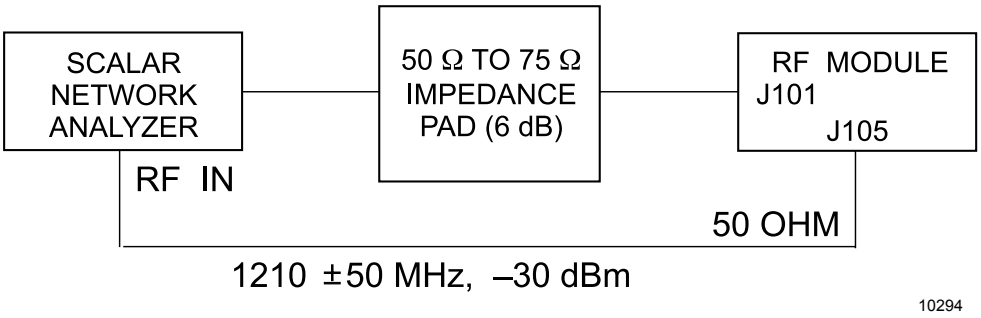

Figure 6-6. Equipment Setup for RF Module Frequency Response Check

2. Set the receive frequency to 1210 MHz.
3. Adjust the MGC so the level at J105 is –35 dBm.
4. Verify that the deviation inside the ±10 MHz bandwidth for which the 1210 MHz level is used as a reference is 0.5 dB or less. If it is more than –35 dB, check whether CA01 in the tuner pack is out of alignment.

   Note: There is no change in the slope of the bandwidth even if F101 is adjusted. Refer to Figure 6-10 for the locations that change when F101 is adjusted.

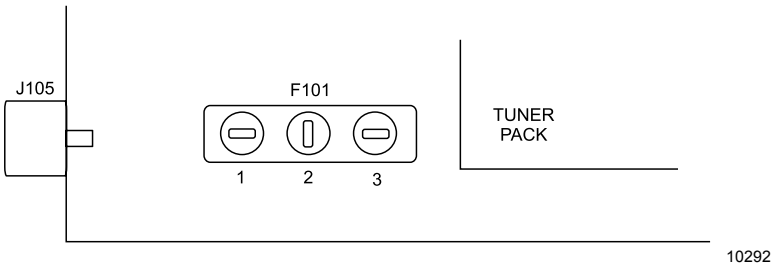

Figure 6-7. Component Locations

When adjusting F101, the following locations change (see Figure 6-11):

1. Left side of filter
2. Center of filter
3. Right side of filter

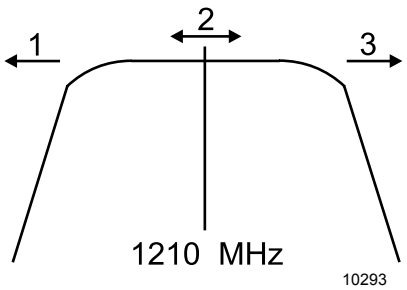

Figure 6-8. F101 Adjustment Points

Second Converter Adjustment

Adjustment Procedure:

1. Set up the equipment as in Figure 6-12.

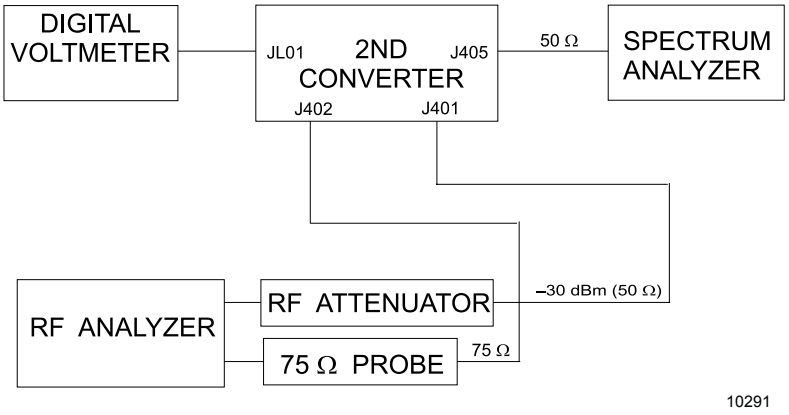

Figure 6-9. Equipment Setup for 2nd Converter Adjustment

2. Connect a DC volt meter between JL01 pin 9 and ground, and measure the VCO tuning voltage.
3. Set the oscillation frequency to 409.5 MHz, and adjust L407 so the voltmeter reading is 4 $\pm$ 0.5 V.

4. Set the oscillation frequency to 549.5 MHz, and check that the voltmeter reading is 17 $\pm$ 1 V.
5. Measure the output at J405 with the spectrum analyzer, and check that both frequencies are within the range of –16 $\pm$ 4 dBm and that they vary smoothly as the frequency is changed from its bottom to its top limit. Do not connect anything to J405 after completing this check.
6. Connect the network analyzer output to J404 and the input to J402. Check that there is no solder touching the cut land before testing, and be sure to remove solder if any is touching on the test pad.
7. Set the oscillation frequency to 549.5 MHz, and check that the deviation in the amplitude characteristic at 479.5 $\pm$ 20 MHz is 0.5 dB or less.
8. Set the oscillation frequency to 409.5 MHz, and adjust C410 so the deviation in the amplitude characteristic at 479.5 $\pm$ 20 MHz is 0.5 dB or less.
9. Connect the network analyzer output to J401 and the input to J402. Apply solder to the cut land so as to produce a short.
10. Set the oscillation frequency to 549.5 MHz, and adjust C408 and C409 so the deviation in the amplitude characteristic at 479.5 $\pm$ 20 MHz is 0.5 dB or less.
11. Set the oscillation frequency to 409.5 MHz, and adjust C408 and C409, and adjust as in step 10.
12. Repeat steps 10 and 11 two or three times. Adjust so the difference between the two levels is minimized.
13. Check that the conversion gain at 479.5 MHz is 4 $\pm$ 1 dB.
14. With the PLL unlocked, check that JL01 pin 9 is high.

RF AND IF CHECKS

Overall Frequency Response Check for RF and 2nd Converter

Check Conditions:

- Set up the equipment as in Figure 6-13.

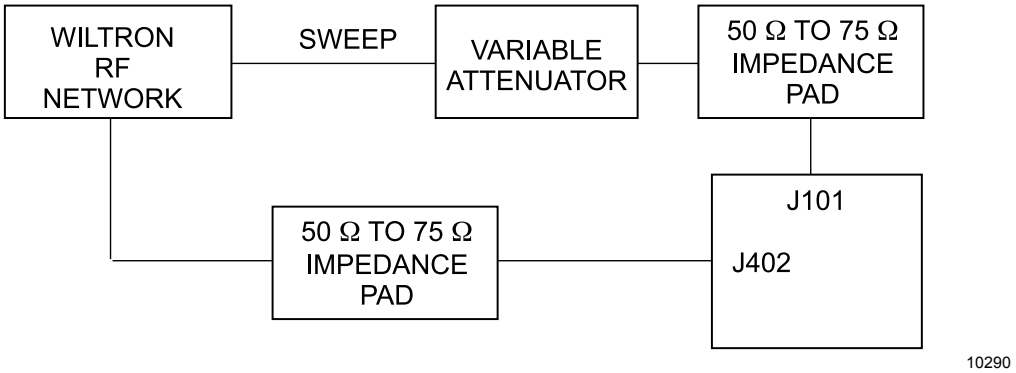

Figure 6-10. Equipment Setup for Overall Frequency Response Check

- Input: J101, J102, J103, or J104, 1210 MHz, –30 dBm (75 Ω)
- Output: J402 (75 Ω)
- Receive frequency: 1210 MHz
- AFC: OFF
- AGC: OFF
- MGC: At a position corresponding to –30 dBm at J402

Check Procedure:

1. Input the signal from J101, and check that the ripple for 1210 ± 10 MHz, using J402 output, is ± 0.5 dB or less when using 1210 MHz as the reference.
2. Check that the ripple for 1210 ± 20 MHz is ± 1 dB or less.
3. Switch the 2nd converter module at this time to 409.5 MHz and 549.5 MHz, and check that both satisfy specifications.

Check Specifications:

- 1210 ± 10 MHz ripple within pass-thru BW: ± 0.5 dB or less
- 1210 ±20 MHz ripple within pass-thru BW: ± 1.0 dB or less

Return Loss Check

Check Conditions:

- Use an Advantest R3762A vector analyzer (or equivalent).
- Check whether a DC block is inserted between the terminal to be measured and the vector analyzer, and that any LNB is disconnected.
- Input: J101, J102, J103, or J104, 950 to 1210 MHz, –10 dBm (75 Ω)
- RF AGC voltage: Check that all RF module circuits are operational.
- MGC: At a position corresponding to –30 dBm at J402

Check Procedure:

Check that the return loss at J101, J102, J103, and J104 is 9 dB or more.

Check Specifications:

– Input return loss: ± 9 dB

IF Filter Adjustment

Adjustment Conditions:

- Connect the equipment as in Figure 6-14.

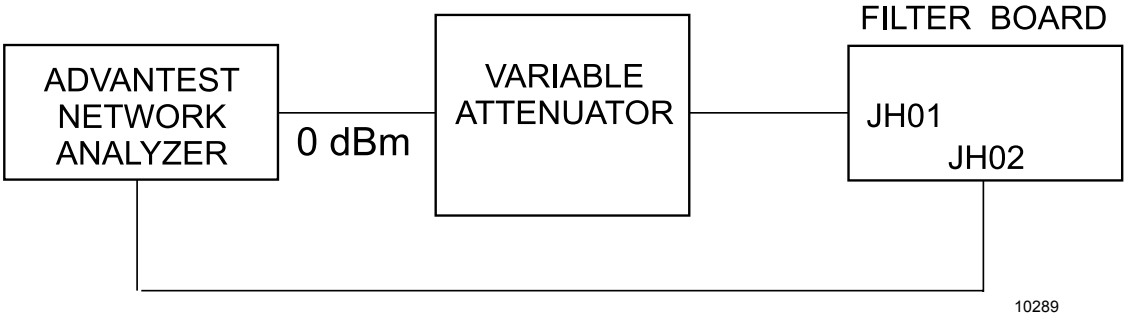

Figure 6-11. Equipment Setup for Filter Adjustments

- Input level: 0 dBm

16, 18, 22, and 25 MHz Bandpass Frequency (BPF) Adjustment

Adjustment Procedure:

1. See Figures 6-15 and 6-16, and select IF BW 16 MHz. Call up the file 16MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and marker ▼ 1 (70 MHz point) match.

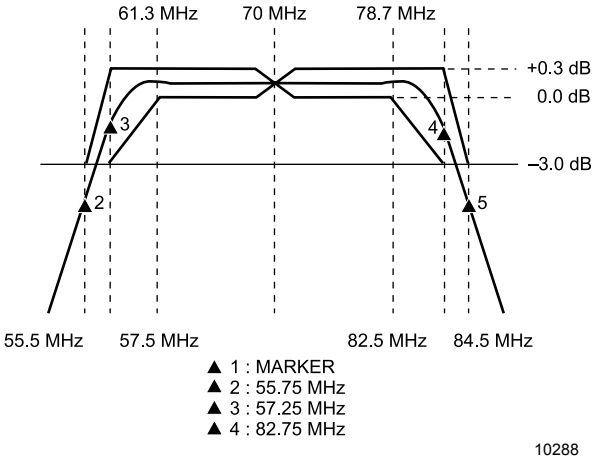

Figure 6-12. Pass Characteristics

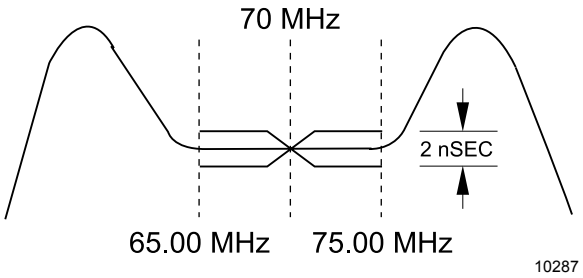

Figure 6-13. Delay Characteristics

2. Adjust LH11 so the –3 dB BW falls inside the frame for adjustment.
   ▼ 2: 61.5 MHz
   ▼ 3: 62.5 MHz
   ▼ 4: 77.5 MHz
   ▼ 5: 78.5 MHz

3. Select IF BW 18 MHz. Call up the file 18MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and marker ▼ 1 (70 MHz point) match.

4. Adjust LH21 so the –3 dB BW falls inside the frame for adjustment.
   ▼ 2: 60.5 MHz
   ▼ 3: 61.5 MHz
   ▼ 4: 78.5 MHz
   ▼ 5: 79.5 MHz

5. Select IF BW 22 MHz. Call up the file 22MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and marker ▼ 1 (70 MHz point) match.

6. Adjust LH31 so the –3 dB BW falls inside the frame for adjustment.
   ▼ 2: 58.5 MHz
   ▼ 3: 61.5 MHz
   ▼ 4: 78.5 MHz
   ▼ 5: 79.5 MHz
7. Select IF BW 25 MHz. Call up the file 25MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and marker ▼ 1 (70 MHz point) match.
8. Adjust LH11 so the –3 dB BW falls inside the frame for adjustment.
   ▼ 2: 57.0 MHz
   ▼ 3: 58.0 MHz
   ▼ 4: 82.0 MHz
   ▼ 5: 83.0 MHz

27 MHz BPF Adjustment

Adjustment Procedure:

1. See Figures 6-17 and 6-18, and select IF BW 27 MHz-C. Call up the file NULL_27M, adjust the input level–using the variable attenuator–so the null point is clearly visible, and adjust each null point to the position given by the markers. See Table 6-3 for the marker number and which coil to adjust.

Table 6-3. Markers and Their Adjustment Coils

Null Point (Marker Number)	Core to Adjust
1	L12 (LF52)
2	L11 (LF51)
4	L14 (LF54)
5	L15 (LF55)

Marker Number

▼ 1: 31.75 MHz
▼ 2: 43.75 MHz
▼ 3: 70.00 MHz
▼ 4: 103.00 MHz
▼ 5: 130.00 MHz
▼ 6: 56.50 MHz
▼ 7: 83.50 MHz

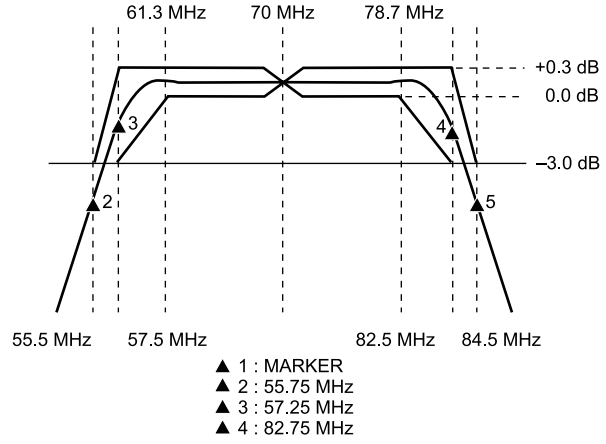

Figure 6-17. Pass Characteristics

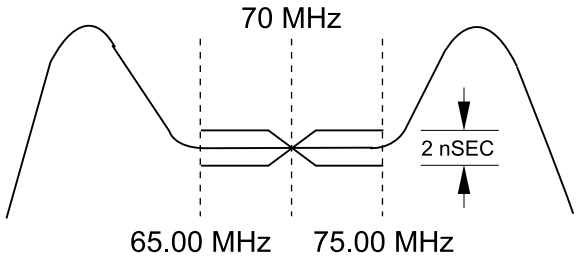

Figure 6-18. Delay Characteristics

2. Call up the file 27MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and the 70 MHz point match.
3. Turn cores LF13, LF16, and LF17 (LF53, LF56, and LF57) to adjust the pass-thru bandwidth and delay characteristics to the specified values (so they lie within the frame). If adjustment using only the above cores, turn cores LF11 and LF15 (LF51 and LF55) to compensate. If adjustment is still impossible, turn LF12 (LF52) and LF14 (LF54) to compensate.
   Be sure to adjust so the delay is nearly the same height as the left and right peaks.
4. Adjust the IF BW 27 MHz Ku filter the same as in step 3. The cores to be adjusted are those indicated inside the parentheses in step 3.

Adjustment Specifications:

- Deviation Within Pass-thru Bandwidth 70 MHz $\pm$ 8.0 MHz: $\pm$ 0.3 dB
- Delay deviation 70 MHz $\pm$ 5.0 MHz: 2 nsec
- –3 dB bandwidth 70 MHz $\pm$ 13.5 MHz: $\pm$ 0.75 MHz

36 MHz BPF Adjustment

Adjustment Procedure:

1. See Figures 6-19 and 6-20, and select IF BW 36 MHz-C. Call up the file NULL_36M, and adjust the input level, using variable attenuator, so the null point is clearly visible, and adjust each null point to the position shown by the markers (See Table 6-4).

Table 6-4. Markers and Their Adjustment Coils

Null Point (Marker Number)	Core to Adjust
1	L32 (LF72)
2	L31 (LF71)
4	L34 (LF74)
5	L35 (LF75)

Marker Number

▼ 1: 27.25 MHz
▼ 2: 38.50 MHz
▼ 3: 70.00 MHz
▼ 4: 104.50 MHz
▼ 5: 144.25 MHz
▼ 6: 52.00 MHz
▼ 7: 88.00 MHz

2. Call up the file 36MHz_BPF, and adjust the variable attenuator so the point of intersection within the frame and the 70 MHz point match.

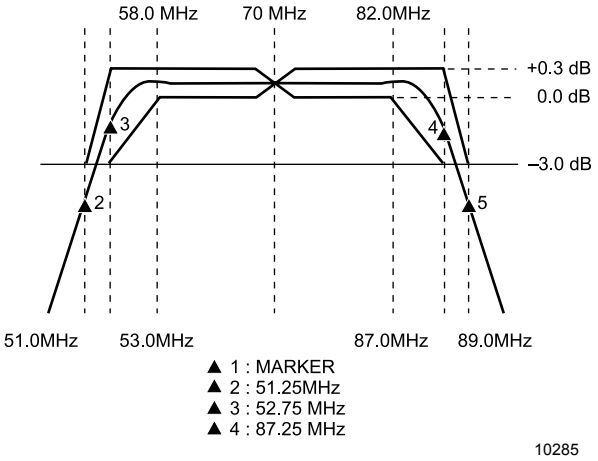

Figure 6-19. Pass Characteristics

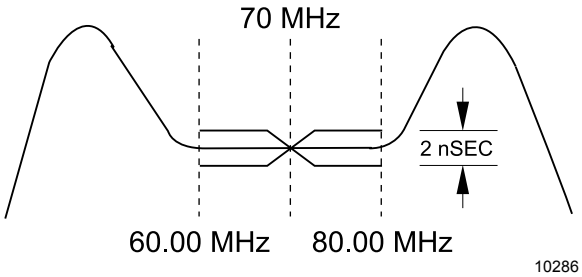

Figure 6-20. Delay Characteristics

3. Turn LF33, LF36, and LF37 (LF73, LF76, and LF77) cores, to adjust the pass-thru bandwidth and delay characteristics values (so they lie within the frame). If adjustment is impossible, using only the above cores, turn cores LF31 and LF35 (LF71 and LF75) to compensate. If adjustment is still impossible, turn LF32 (LF72) and LF34 (LF74) to compensate.
   Be sure to adjust so the delay is nearly the same height as the left and right peaks.
4. Adjust the IF BW 27 MHz Ku filter the same as in step 3. The cores to be adjusted are those indicated inside the parentheses in step 3.

Adjustment Specifications:

- Deviation Within Pass-thru Bandwidth 70 MHz $\pm$ 12.0 MHz: $\pm$ 0.3 dB
- Delay deviation 70 MHz $\pm$ 10.0 MHz: 2 nsec
- –3 dB bandwidth 70 MHz $\pm$ 18.0 MHz: $\pm$ 0.75 MHz

210 MHz Trap Adjustment

Adjustment Procedure:

1. Adjust the variable attenuator to set the input level to –30 dBm (attenuator 30 dB).
2. Select IF BW 25 MHz, and call up the file TRAP_210M.
3. Adjust LH01 and LH02 so the difference between marker ▼ 1 and marker ▼ 2 is –30 dB or more.
   ▼ 1: 70 MHz
   ▼ 2: 210 MHz
4. Check that the difference between marker ▼ 1 and marker ▼ 2 is –30 dB or more for the other BPF levels as well.

AGC Adjustment

Adjustment Condition:

- Input –30 dBm at 75Ω, 70 MHz CW to 70 MHz IF IN.

Adjustment Procedure:

1. Connect the spectrum analyzer to the 70 MHz IF (J204), and observe the output level. Because the output impedance is 75 Ω, be sure to account for the insertion loss when using a conversion pad.
2. Turn on the AGC, and adjust R533 so the output level is –30 ± 0.2 dBm.
3. Measure the DC voltage between J501 pin 3 and ground, and note this voltage (generally 6 to 8 V under normal conditions).
4. Connect the specified loop-thru cable between 70 MHz IN and OUT.
5. Input a –40 dBm signal and 75 Ω at 1210 MHz CW to RF #1, and set to receive mode.
6. Adjust R574 so the DC voltage between JW05 pin 3 and ground is within ± 1 V, compared to the voltage read in step 3.
7. Connect a DC voltmeter between JW05 pin 11 and ground, and observe the AGC voltage.
8. Set the input level for RF #1 to –60 dBm, and adjust R553 so the AGC voltage is 2 ± 0.5 V.
9. Set the input level RF #1 to –20 dBm, and adjust R556 so the AGC voltage is 8 ± 1.0 V.
10. Repeat steps 7 and 8 two or three times.
11. Perform signal meter correction, using a separate procedure, and write the corrected value.

Reference:

Unlike past SCC models, in addition to hardware (analog) adjustment, this model also has software (digital) correction functions. Adjustment values for several points are written after first adjusting to the specified operation points, using AGC adjustment.

PLD Adjustment

Adjustment Procedure:

1. Apply a bit of solder to the cut land for testing pad to L301.
2. Connect J202 and J203 with a 50 Ω coaxial cable.
3. Turn off the video modulation, connect a DC voltmeter to J301, and wait about 10 seconds. Adjust R329 so the reading is within 0 ± 0.02 V.
4. Set the video signal to sweep, and turn off pre-emphasis.

5. Turn off composite de-emphasis, and observe the composite output waveform on an oscilloscope. Be sure to connect a terminal resistor near the oscilloscope's input terminal for this measurement.
6. Using the marker position as a reference, adjust C311 and R311 so the amplitude of 1 to 8 MHz is generally flat and the amplitude at 10 MHz is 110% to 80% compared to that at 1 MHz.
7. Change the video signal to one that includes an NTC-7 combination. Set both the pre-emphasis and de-emphasis to 525, adjust the video level, then observe the video waveform for the composite output.
8. Set the C/N to about 10 dB so noise appears on the TV monitor. Adjust R307 so the white noise and black noise are at about the same level.
9. Adjust R255 so chrominance-luminance (C/L) intermodulation is optimized.

Reference:
If the frequency response of the RF converter, etc., is faulty, problems such as sparkle noise balance trouble will appear unless the minimum points for Ku and C are made to match, using the equipment in step 8, above. It is also OK to adjust R307 for balancing when other noise-balance and C/L intermodulation equipment is off. When drastically off, be sure to check the RF converter, etc. There is a risk of trouble, such as dynamic threshold problems, when R255 is turned too far CCW, and similarly, S/N problems (increased noise at 1 MHz and under) during weak C/N when R255 is turned too far CW. Make sure to check that the RF converter, etc., are not faulty and that there has not been a mistaken operation.

During step 7, above, adjust R311 to the spot that raises the amplitude of the high band before adjusting C311.
Note that in step 6, above, the correct waveform is not displayed because of the effects of the cable if a terminal resistor is not connected or if the position is inappropriate.

Video Level/Sync Chip Clamping Adjustment

Adjustment Procedure:
1. Set the pre-emphasis to 525 and frequency deviation to 10 MHz p-p.
2. Connect a video analyzer to VIDEO #2, and observe the output level.
3. Set the video level to 75, and adjust RV18 so the bar level is 100 $\pm$ 1 IRE.
4. Adjust RM02 so the pedestal level of the video output is within 0 $\pm$ 0.5 V.
5. Connect the video analyzer to COMPOSITE OUT, and observe the output level.
6. Set the gang and emphasis for the composite level to ON, and adjust RG05 so the bar level is 100 $\pm$ 1 IRE.
7. Turn off pre-emphasis, set the UUT emphasis OFF, and adjust RG02 so the bar level is 100 $\pm$ 1 IRE.

Reference:

There are two methods of measuring the pedestal level in step 4, above. One uses an oscilloscope, while the other uses video analyzer VM-700A. Set the oscilloscope to DC input before using it. When using the VM-700A, make settings in the order of waveform, menu, clamp-couple, and DC coupling.
Note that the value will not be saved after setting the video level to 75 in step 3, above unless a save operation is performed, and that the video level will not become 75, even when composite is set to gang.

Video De-emphasis Adjustment

Adjustment Procedure:

1. Set the video signal to NTSC, pre-emphasis to 525, and frequency displacement to 27.6 MHz p-p.
2. Set the UUT de-emphasis to 525, and connect a video analyzer to COMPOSITE OUT. Adjust the unit video level so the bar level is 100 $\pm$ 1 IRE.
3. Set the video analyzer to Bar Line Time, and observe the bar waveform. Adjust RV03 so the left corner is more or less a right angle. Verify that the Line Time Distortion is 1% or less.
4. Set the video analyzer to C/L Gain Delay. Adjust RV06 so the C/L gain is within 110 $\pm$ 1%.
5. Set the video analyzer to Bar Line Time, and verify that the Line Time Distortion is 1% or less. If 1% is exceeded, repeat steps 3 and 4.
6. Set the video signal to PAL, pre-emphasis to 625, and frequency deviation to 24.0 MHz p-p.
7. Set the UUT de-emphasis to 625, and connect a video analyzer to COMPOSITE OUT. Adjust the unit video level so the bar level is 100 $\pm$ 1 IRE.
8. Set the video analyzer to Bar Line Time, and observe the bar waveform. Adjust RV09 so the left corner is more or less a right angle. Verify that the Line Time Distortion is 1% or less.
9. Set the video analyzer to C/L Gain Delay. Adjust RV12 so the C/L gain is within 110 $\pm$ 1%.
10. Set the video analyzer to Bar Line Time, and verify that the Line Time Distortion is 1% or less. If 1% is exceeded, repeat steps 8 and 9.

DG/DP Characteristic Check
Adjustment Conditions:

- Connect the IF filter board and the loop-thru cable in the specified manner.
- Set the measurement device as follows:
  - RF level: –30 dBm
  - C/N ratio: 30 dB or more
- Condition 1: Video signal: NTSC
  - Pre-emphasis: 525
  - Frequency Deviation: 18.4 MHz p-p
- Condition 2: Video signal: NTSC

- Pre-emphasis: 525
- Frequency Deviation: 27.6 MHz p-p

- Condition 3: Video signal: PAL
  - Pre-emphasis: 625
  - Frequency Deviation: 16.0 MHz p-p
- Condition 4: Video signal: PAL
  - Pre-emphasis: 625
  - Frequency Deviation: 24.0 MHz p-p

Adjustment Procedure:

1. Set the UUT to receive mode, connect a video analyzer to VIDEO #1 and COMPOSITE OUT, and measure the video characteristics.
   Use 27 MHz for IF BW when using settings for Conditions 1 or 2, and use 36 MHz for Conditions 3 or 4.
   When de-emphasis is 525 under Conditions 1 or 2, use 4.2 MHz for the filter.
   When de-emphasis is 625 under Conditions 3 or 4, use 5.5 MHz for the filter.
   When the video level is set for Conditions 1 or 2, adjust so the bar level is 100 $\pm$1 IRE
   When the video level is set for Conditions 3 or 4, adjust so the bar level is 700 $\pm$ 7 mV.
2. Set the video analyzer to DG/DP, and check that the latest specifications are satisfied when average picture level (APL) is set to any of 10%, 50%, or 90%. Check both C and Ku bands.
3. If the specifications are not met in step 2, readjust IF filter PH01. Effective adjustment locations follow:
   a. Use LF76 and LF77 when IF BW is 36 MHz under Ku-NOR (or C-INV).
   b. Use LF36 and LF37 when IF BW is 36 MHz under C-NOR (or Ku-INV).
   c. Use LF56 and LF57 when IF BW is 27 MHz under Ku-NOR (or C-INV).
   d. Use LF16 and LF17 when IF BW is 27 MHz under C-NOR (or Ku-INV).
   In all cases, check the video characteristics by turning both of the corresponding coil cores in the same direction either CW or CCW. The rotation angle should generally be 45 degrees or less. If turned more than this, recheck the pass-thru characteristics of the IF filter.

Video Filter Switching Operation Check

Check Conditions:

- Video signal: Video sweep
- Frequency Deviation: 27.6 MHz p-p
- Pre-emphasis: 525
- RF level: –30 dBm
- C/N ratio: 30 dBm or less
- IF BW: 36 MHz
- De-emphasis: 525
- Condition 1: Video signal: NTSC
  Pre-emphasis: 525
  Frequency Deviation: 27.6 MHz p-p
- Condition 2: Video signal: NTSC
  Pre-emphasis: 525
  Frequency Deviation: 18.4 MHz p-p

Adjustment Procedure:

1. Using the conditions in Condition 1, connect a video analyzer to COMPOSITE OUT, and check that the latest specifications for C/L gain, delay, and multiburst are met. If they are not met, readjust C311, R311, RV03, and RV06.
2. Set the video signal as in Condition 2, and set the de-emphasis to 625. Connect a video analyzer to COMPOSITE OUT, and set the video filter to 4.2, and check that the latest specifications for C/L gain, delay, and multiburst are met. If they are not met, readjust RV09, RV12, etc.
3. Connect a video analyzer to VIDEO #1, and set the video filter to 5.0. Check that the latest specifications for C/L gain, delay, and multiburst are met. If they are not met, readjust FV03.
4. Connect a video analyzer to VIDEO #1, and set the video filter to 5.5. Check that the latest specifications for C/L gain, delay, and multiburst are met. If they are not met, readjust FV02.
5. Connect a video analyzer to VIDEO #1, and set the video filter to 6.0. Check that the latest specifications for C/L gain, delay, and multiburst are met. If they are not met, readjust FV01.

C/N Detection Circuit Adjustment

Adjustment Conditions:

- Video signal: PAL, 50% pedestal
- Pre-emphasis: 625
- Frequency Deviation: 27.6 MHz p-p
- RF level: –30 dBm
- IF BW: 36 MHz
- De-emphasis: 525
- METER SELECT: ON

Adjustment Procedure:

1. Connect a DC voltmeter to both terminals of R670, and observe the A/D input voltage.
2. Set C/N to 10 $\pm$ 0.5 dB, and adjust R668 so the voltmeter reading is 1 $\pm$ 0.2 V.
3. Set C/N to 25 $\pm$ 0.5 dB, and adjust R607 so the voltmeter reading is 4 $\pm$ 0.2 V.
4. Repeat steps 2 and 3 two or three times.
5. Perform C/N meter correction as given next in this chapter, and record the correction value.

Reference:

Unlike past SCC models, in addition to hardware (analog) adjustment, this model also has software (digital) correction functions. Correction values for several points are written after first adjusting the detection circuit to the specified operating points.

METER ADJUSTMENT

Adjustment Condition:

- Connect to main unit only

Adjustment Procedure:

1. On Menu #6, turn the MENU knob clock-wise while pressing the RIGHT and LEFT pushbuttons to open the meter adjusting menu.
2. Move the meter reading, using the SELECT knob so the LCD and meter readings match.
3. Press the RIGHT pushbutton so the LCD continues changing, and adjust the SELECT knob so the meter and display match each time.
4. When the LCD stops changing, even though the RIGHT pushbutton is still pressed, press the LEFT pushbutton, and check that the LCD and meter readings match. Once done, press the SAVE pushbutton, and exit this menu.

C/N Signal Meter Adjustment

Adjustment Conditions:

- Connect the equipment as in Figure 6-19.

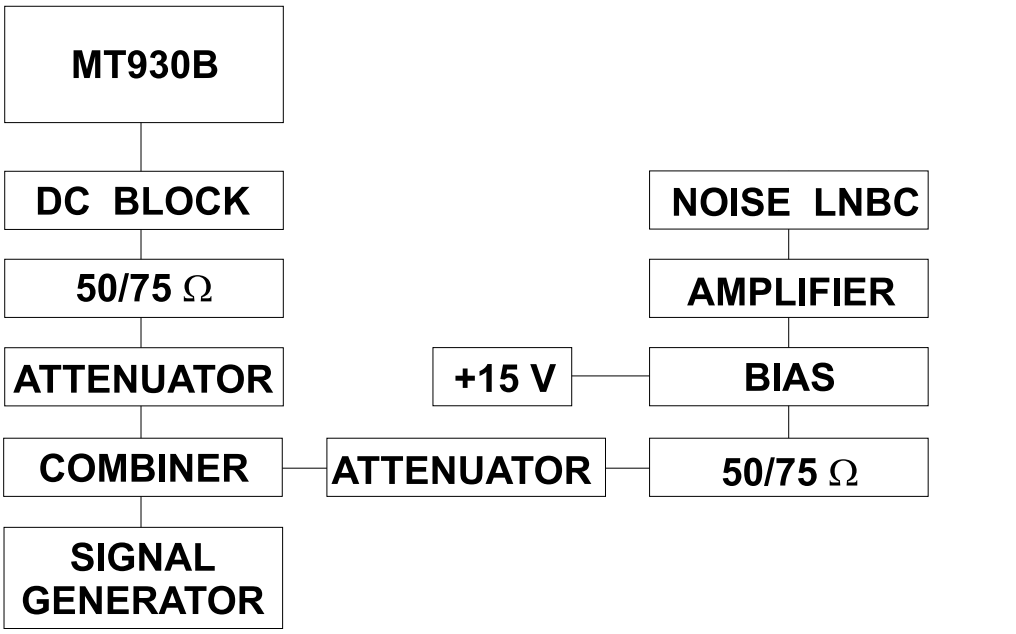

Figure 6-14. Equipment Setup for Signal Meter Adjustment

- Receive frequency: 1210 MHz
- RF input port: #1
- IF BW: 27 MHz
- LNB power: OFF
- AFC: ON
- AGC: ON

Adjustment Procedure:

Make sure the C/N and signal level detection circuit adjustments have been completed before performing this adjustment.

1. On page 2 of Menu 1, press the EDIT pushbutton while pressing the RIGHT and LEFT pushbuttons to open the signal meter adjustment menu.
2. Press the LEFT pushbutton to bring the display to where it no longer changes.
3. Follow the directions on the LCD, apply input to the unit, and press the SAVE pushbutton.
4. Press the RIGHT pushbutton to change the display, and perform the same operation as in steps 2 and 3.
5. When the LCD display stops changing, even though the RIGHT pushbutton is pressed, press the EDIT pushbutton to exit this menu.

Audio VCO Adjustment

Adjustment Procedure:

1. Connect a DC voltmeter between pins 1 and 5 of J11, and observe the tuning voltage.
2. Set the audio subcarrier frequency of #1 to 50 kHz, and adjust LB11 so the tuning voltage is 2 $\pm$ 0.1 V.
3. Set the audio subcarrier frequency of #1 to 9995 kHz, and adjust LB11 so the tuning voltage is 10.5 $\pm$ 1 V.
4. Connect a DC voltmeter between pins 1 and 5 of J41, and observe the tuning voltage.
5. Set the audio subcarrier frequency of #2 to 50 kHz, and adjust LB41 so the tuning voltage is 2 $\pm$ 0.1 V.
6. Set the audio subcarrier frequency of #2 to 9995 kHz, and adjust LB41 so the tuning voltage is 10.5 $\pm$ 1 V.
7. Connect a DC voltmeter between pins 1 and 5 of J71, and observe the tuning voltage.
8. Set the audio subcarrier frequency of #3 to 50 kHz, and adjust LB71 so the tuning voltage is 2 $\pm$ 0.1 V.
9. Set the audio subcarrier frequency of #3 to 9995 kHz, and adjust LB71 so the tuning voltage is 10.5 $\pm$ 1 V.

Audio Discriminator Adjustment

Adjustment Conditions:

- Set the FM signal generator as follows and the input to JB01:
  - Carrier signal: 6.8 MHz
  - Output level: –9 $\pm$ 1 dBm
  - Modulation signal: 1 kHz
  - Frequency Deviation: $\pm$ 16 MHz p-p
- For each of AUDIO #1, #2, and #3, set as follows:
  - Subcarrier frequency: 6800 kHz
  - Output level: 100
  - De-emphasis: FLAT

Adjustment Procedure

10. Put the UUT in receive mode, and set the BW to 440 kHz for #1 and to 880 kHz for #2 and #3.
11. Connect the DC voltmeter (dual-polarity) between pins 2 and 3 of JA11, and observe the voltage.
12. Connect the audio analyzer to AUDIO #1.
13. Adjust LA11 so the voltmeter reading is 0 $\pm$ 10 mV.
14. Adjust LA12 so the distortion ratio is minimized.

15. Repeat steps 4 and 5 several times.
16. Connect the DC voltmeter (dual-polarity) between pins 2 and 3 of JA41, and observe the voltage.
17. Connect the audio analyzer to AUDIO #2.
18. Adjust LA41 so the voltmeter reading is 0 ± 10 mV.
19. Adjust LA42 so the distortion ratio is minimized.
20. Repeat steps 9 and 10 several times.
21. Connect the DC voltmeter (dual-polarity) between pins 2 and 3 of JA71, and observe the voltage.
22. Connect the audio analyzer to AUDIO #3.
23. Adjust LA71 so the voltmeter reading is 0 ± 10 mV.
24. Adjust LA72 so the distortion ratio is minimized.
25. Repeat steps 14 and 15 several times.

Audio IF Adjustment

Adjustment Conditions:

- Set the FM signal generator as follows and the input to JB01:
  - Carrier signal: 6.8 MHz
  - Output level: –9 ± 1 dBm
  - Modulation signal: 1 kHz
  - Frequency Deviation: ± 150 kHz p-p
- For each of AUDIO #1, #2, and #3, set as follows:
  - Subcarrier frequency: 6800 kHz
  - Output level: 100
  - De-emphasis: FLAT

Adjustment Procedure:

1. Put the UUT in receive mode, and set the subcarrier frequency to 6800 kHz for #1 and to 880 kHz for #2 and #3.
2. Connect the audio analyzer to the output of AUDIO #1.
3. Lower the signal generator output level until audio output is approximately 3 dB or lower.
4. Adjust LB12 so AUDIO #1 output is maximized.
5. Adjust LB42 so AUDIO #2 output is maximized.
6. Adjust LB72 so AUDIO #3 output is maximized.

Audio IF Filter Check

Check Conditions:

- Input: 6.8 MHz CW at –20 dBm
- Output: JB01.
- #2 BW: 880 kHz
- #3 BW: 880 kHz
- Subcarrier frequency: 6800 kHz

Check Procedure:

1. Connect the DC voltmeter between pins 1 and 4 of JA41 for #2, and note the signal meter voltage.
2. Increase the carrier wave level 3.0 dB more than noted in step 1.
3. Vary the carrier wave frequency, and find the frequency equivalent to the signal meter voltage noted in step 1.
4. Calculate the difference, and set to a –3 dB bandwidth.
5. Increase the carrier wave level 20.0 dB more than noted in step 1.
6. Vary the carrier wave frequency, and find the frequency equivalent to the signal meter voltage noted in step 1.
7. Calculate the difference, and set to a –20 dB bandwidth.
8. If the values calculated in steps 4 and 7 do not satisfy the latest specifications, adjust LC41, LC42, and LC43 for #2 or LC71, LC72, and LC73 for #3.

Audio 880 kHz Filter Adjustment

Perform the following adjustment if the bandwidth does not satisfy the specifications when the BW is 880 kHz for AUDIO #2 or #3.

Adjustment Conditions:

- Scalar Network sweep frequency: 6.8 $\pm$ 2 MHz
- Scalar Network output level: 6 $\pm$ 2 dBm
- BW: 880 kHz
- Subcarrier frequency: 6800 kHz

Adjustment Procedure:

1. Set the variable attenuator to –39 dB, and connect a detection probe after passing through an amplifier to perform any correction.
2. Connect the output of the variable attenuator to JB01, and set the attenuation level to 0 dB.
3. Connect the amplifier input to JB42 and JB72 for #3.
4. Adjust LC41, LC42, and LC43 for #2, and LC71, LC72, and LC73 for #3.

Audio Level Adjustment

- Set up the FM signal generator as follows and connect the input to JB01:
  - Carrier wave signal: 6.8 MHz
  - Output level: –9 ± 1 dBm
  - Modulation frequency: 1 kHz
  - Frequency Deviation: +150 kHz p-p
- Output of AUDIO #1/#2/#3: Receive mode.
- Audio subcarrier frequency: 6800 kHz.
- Output level: 100
- De-emphasis: FLAT
- AUDIO #1 BW: 440 kHz
- AUDIO #2 and #3 BW: 880 kHz

Adjustment Procedure:

1. Adjust RE11 so the output level at rear panel AUDIO #1 is 19 ± 0.1 dBm.
2. Adjust RE41 so the output level at rear panel AUDIO #2 is 19 ± 0.1 dBm.
3. Adjust RE71 so the output level at rear panel AUDIO #3 is 19 ± 0.1 dBm.
4. Add a 75 ohm-load to the output of front panel AUDIO #1, and confirm that the waveform tip and trough are each 0.6 ± 0.1 V.
5. Repeat step 4 for Audios #2 and #3.
6. Change the FM signal generator frequency deviation to ± 50 kHz p-p.
7. Change the FM signal generator modulation frequency to 100 Hz.

   Note: The bandwidth of AUDIO #2 and #3 is 110 kHz

8. Connect an audio voltmeter (< 100 k Ω) between pins 2 and 3 of J901.
9. Adjust R941 so the voltage reads 2.45 ± 0.1 V
10. Adjust R942 so the voltage reads 2.45 ± 0.1 V.
11. Adjust R972 so the voltage reads 2.45 ± 0.1 V.
12. Connect the voltmeter between pins 1 and 2 of R971.
13. Change the FM signal generator modulation frequency to 10 kHz.
14. Connect the audio voltmeter between pins 2 and 3 of J901.
15. Adjust R942 so the voltage reads 2.45 ± 0.1 V.
16. Adjust R972 so the voltage reads 2.45 ± 0.1 V.
17. Change the FM signal generator frequency deviation to ± 5 kHz p-p.
18. Change the FM signal generator modulation frequency to 100 Hz.
19. Set a reference value, and press Ratio under Measurement to make the reference zero.
20. Change the FM signal generator modulation frequency to 1 kHz. The reading should be –7 ± 2 dB.

21. Change the FM signal generator modulation frequency to 10 kHz. The reading should be –17 ± 2 dB.
22. Change the FM signal generator frequency deviation to ± 50 kHz p-p.
23. Change the FM signal generator modulation frequency to 100 Hz.
24. Change de-emphasis to EXPAND.
25. Adjust R964 so the output level of rear panel AUDIO #2 is 19 ± 0.1 dBm.
26. Repeat step 25 for AUDIO #3, but adjust R994 to get the same result.

RELAY 1 CHECK

Check Procedure:

1. Turn the MENU knob to Menu #5 *Receiver Config*.
2. Turn the SELECT knob to page 3 of 6.
3. Press the EDIT pushbutton.
4. Turn the SELECT knob while the cursor is flashing under the left item on line 3, and turn the display ON and OFF. At this time, verify that the continuity between the C terminal and *NC* or *NO* terminal for *RLY #1* switches *ON* and *OFF*.

Alarm Relay 2 Check

Check Procedure:

1. Turn the MENU knob to Menu #5 *RECEIVER CONFIG*.
2. Turn the SELECT knob to page 4 of 6.
3. Press the EDIT pushbutton.
4. Turn the SELECT knob and set the display at the bottom to *ANTENNA POLARITY*.
5. Press the SAVE pushbutton.
6. Turn the MENU knob to Menu #1 *ACTIVE CHANNEL*.
7. Turn the SELECT knob to page 4 of 12.
8. Press the EDIT pushbutton.
9. Press the RIGHT or LEFT pushbutton to move the cursor below *VER* or *HOR*.
10. Turn the SELECT knob, and verify that the continuity between the C terminal and NC or NO terminal for RLY #2 switches ON and OFF.

AUX Input Check

Check procedure:

1. Turn the MENU knob to #3 *ALARM SET UP*.
2. Turn the SELECT knob to page 2 of 2.
3. Press the EDIT pushbutton.
4. Press the RIGHT or LEFT pushbutton to move the cursor below *AUX IN* (near the center).
5. Turn the SELECT knob, and set the right side of line 3 to *ON LO TRIGGR*.
6. Verify that the ALARM display lights when both of the AUX terminals are shorted and go out when the short is removed.

Video Presence Check

Check Procedure:

1. Turn the MENU knob to #3 *ALARM SET UP*.
2. Verify that the page number is 1 of 2, and press the EDIT pushbutton.
3. Press the RIGHT or LEFT pushbutton to move the cursor below *VIDEO*.
4. Turn the SELECT knob, and set the right side of line 3 to *NO VID*.
5. Press the SAVE pushbutton.
6. Receive a good RF modulated signal.
7. Turn the MENU knob to Menu #1 *ACTIVE CHANNEL*.
8. Turn the SELECT knob to page 2 of 12.
9. Verify that *NO VID* does not appear at the right side of line 3.
10. Turn off the video modulation, and verify that *NO VID* is displayed at the right side of line 3.

LNB Power Check

Check Procedure:

1. Connect a DC voltmeter to RF #1, and observe the LNB voltage.
2. Set the LNB to 0 V, and check that the voltage is within 0 ± 0.01 V.
3. Set the LNB to 13 V, and check that the voltage is within 12.8 to 13.9 V.
4. Set the LNB to 18 V, and check that the voltage is within 18.1 to 19.9 V.
5. Set the LNB to 18 V, connect a load with a current flow of 300 ± 3 mA, and check that the voltage is within 12.8 to 13.9 V.
6. Set the LNB to 18 V, connect a load with a current flow of 500 ± 5 mA, and check that the voltage is within 18.1 to 19.9 V.

7. Set the LNB to 18 V, connect a load with a current flow of 800 mA or more, and check that the protection circuit activates and that output is shut off.
8. Remove the load used in step 7, and return the LNB to 0 V. Then check that output appears when the LNB is set to 13 V and 18 V.

Factory Default Settings Check

Check Procedure:

1. Turn power on while pressing the EDIT and SAVE pushbuttons. Settings will display on the front panel LCD automatically when the pushbuttons are released after the RF Port #1 and #2 LEDs light.

The settings shown in this operation are as follows:

- 1st Format in database
- 1st Transponder in that format
- LNB power = OFF
- Video clamp = Sync Tip
- Interface = RS-232
- Contrast = 20
- Time = 240000
- Date = 010100
- BAUD rate = 19200
- Alarm relay = OFF
- Alarm signal = –45 dB
- Alarm C/N = 10 dB
- Alarm video = OFF
- Alarm AFC = OFF
- Alarm LNB = OFF
- Alarm AUX IN = OFF
- Timer displayed = 0
- Timer MODE = OFF
- Timer date = 0101
- Timer time = 0000
- Timer days = all OFF
- Timer relay = OFF
- Timer Format = NONE
- Relay 1 = NORMAL
- Relay 2 = NORMAL
- Relay hold time = 60 seconds
- Relay delay time = 0 seconds
- Timer hold time = 5 seconds
- Receiver address = 0000

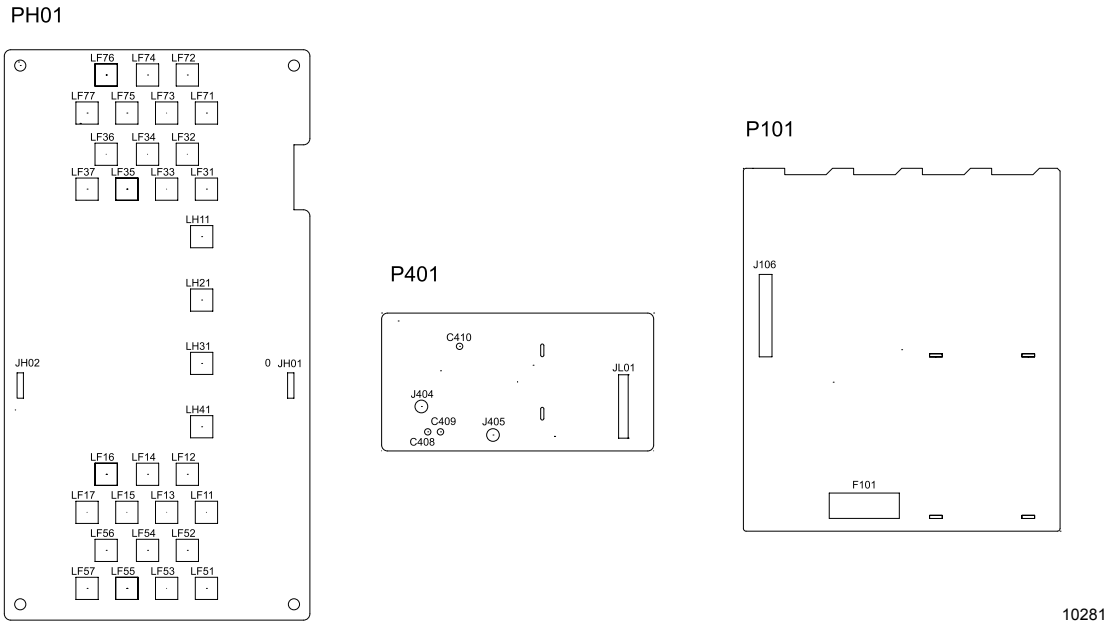

Figure 6-21. MT930B PR01 PC Board Component and Adjustment Locations

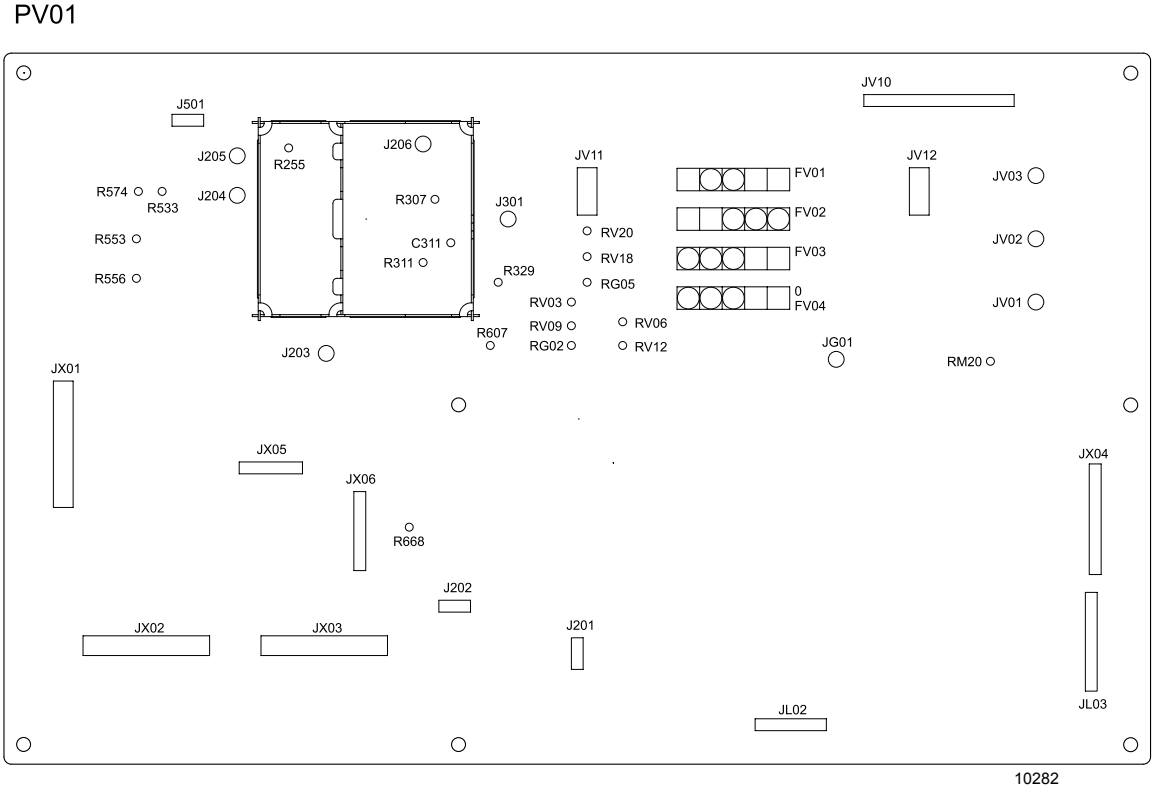

Figure 6-22. MT930B PV01 PC Board Component and Adjustment Locations

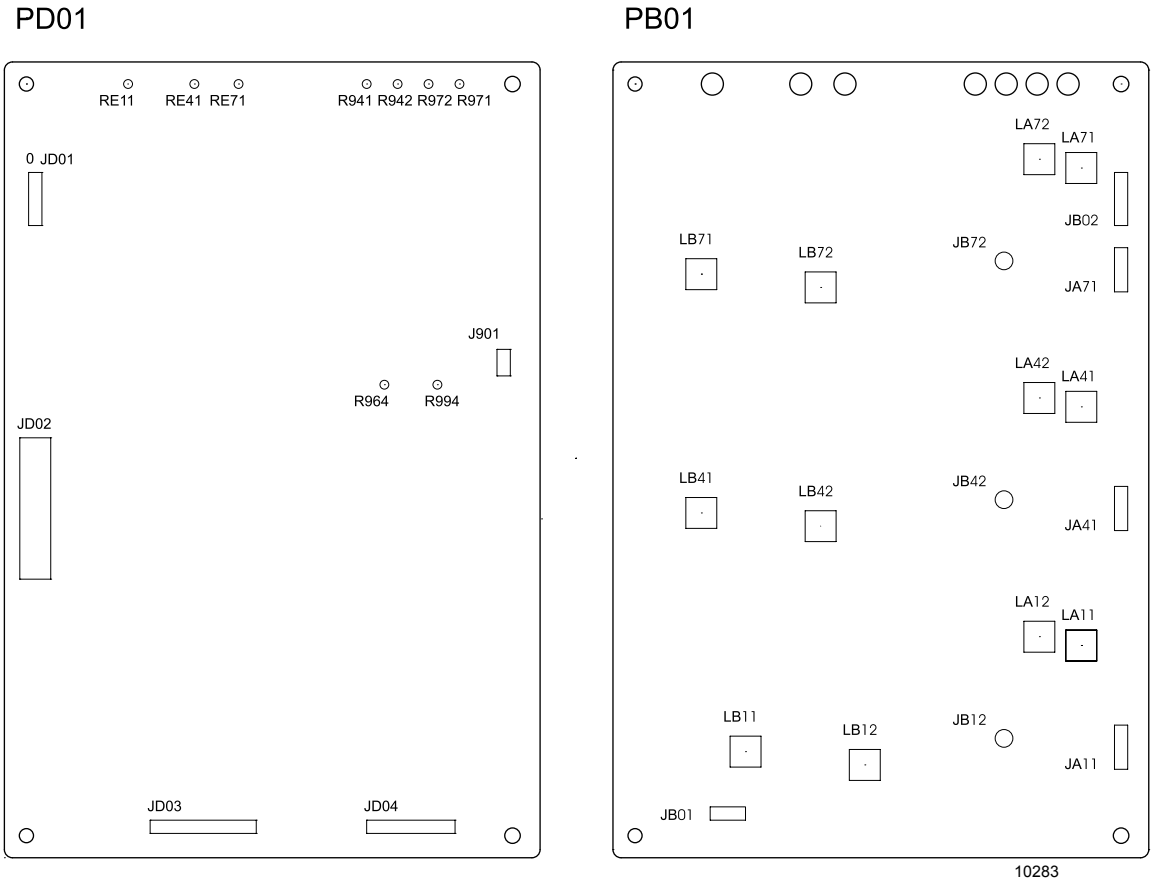

Figure 6-23. MT930B PD01 and PB01 PC Board Component and Adjustment Locations

TEST DATA (Local Leakage) MT930B

Tested by: _____

Date: _____

Receiver Frequency (MHz)	LO (MHz)	2 x LO (MHz)	Input SW: A				Input SW: B			
			LO (dBm)		2 x LO (dBm)		LO (dBm)		2 x LO (dBm)	
			A IN	B IN	A IN	B IN	A IN	B IN	A IN	B IN
950	1562	3124								
970	1582	3164								
990	1602	3204								
1010	1622	3244								
1030	1642	3284								
1050	1662	3324								
1070	1682	3364								
1090	1702	3404								
1110	1722	3444								
1130	1742	3484								
1150	1762	3524								
1170	1782	3564								
1190	1802	3604								
1210	1822	3644								
1230	1842	3684								
1250	1862	3724								
1270	1882	3764								
1290	1902	3804								
1310	1922	3844								
1330	1942	3884								
1350	1962	3924								
1370	1982	3964								
1390	2002	4004								
1410	2022	4044								
1430	2042	4084								
1450	2062	4124								
1470	2082	4164								
1490	2102	4204								
1510	2122	4244								
1530	2142	4284								
1550	2162	4324								
1570	2182	4364								
1590	2202	4404								
1610	2222	4444								
1630	2242	4484								
1650	2262	4524								
1670	2282	4564								
1690	2302	4604								
1710	2322	4644								
1730	2342	4684								
1750	2362	4724								
1770	2382	4764								
1790	2402	4804								
1810	2422	4844								
1830	2442	4884								
1850	2462	4924								
1870	2482	4964								
1890	2502	5004								
1910	2522	5044								
1930	2542	5084								
1950	2562	5124								
1970	2602	5204								
1990	2622	2344								
2010	2642	5284								
2030	2662	5324								
2050	2682	5364								
2070	2702	5404								
2090	2722	5444								
2110	2742	5484								
2130	2762	5524								
2150	2802	5604								

CHAPTER 7

OPTIONS MAINTENANCE

The MT930B Satellite Receiver has no options at this time. If in the near future, Standard Communications chooses to add options to the MT930B Satellite Receiver, a Service Bulletin stating the changes will be generated through the company and made available to the public

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CHAPTER 8

TROUBLESHOOTING PROCEDURES

SOLVING TYPICAL PROBLEMS

Typical C-band problems are terrestrial interference (TI), poor carrier-to-noise (C/N) ratio, and cable loss. These are discussed in the following paragraphs. See Chapter 3, Figures 3-1 or 3-2 for references to controls in parentheses.

Terrestrial Interference

For mild TI (on one side only), rotate the FINE TUNE control (6) right or left (adjusting for best picture) to step the interference off the side of the bandpass filter. The AFC switch (5) can be left ON, but if the TI becomes too strong, the AFC will try to tune to the TI. If this occurs, slide the AFC switch to OFF. The MT900 rear panel 70 MHz TRAP connectors (27) allow insertion of notch filters at 60 MHz and 80 MHz. SCC suggests the use of Microwave Filter Company (telephone 1-800-448-1666) part number 4616-70F. TI can also be suppressed by inserting external, tunable filters in the 950 to 1450 MHz input line. SCC recommends Microwave Filter Company part numbers 5316 (to 1450 MHz) or 8976 (to 1750 MHz).

NOTE: Notch loss for the 8976 filter at 5.0 MHz is 12 dB (max); at 5.5 MHz it is 3 dB. For the 5316, the loss is 18 dB.

For severe TI, passive blocking, such as screens or mounds of earth, should be installed to shield the antenna.

Poor C/N Ratio

A dynamic C/N ratio of approximately 12.5 dB must be provided at the RF input to the receiver. If the C/N ratio falls below this level, impulse noise (sparkles) will start to appear in the picture, usually in the reds and in character-generated letters.

Cable Loss

The RF signal at the receiver input must be at least –60 dBm. The average amplitude at the back of the an antenna dish at C-band is approximately –43 dBm. RG-6U coaxial cable has an approximate seven (7) dB loss per 100 feet, so the maximum cable run without using line amplifiers is approximately 200 feet.

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CHAPTER 9

DRAWINGS

This chapter contains block diagrams, wiring diagrams, and schematics. The contents are as follows:

Block Diagrams

- MT930B Block Diagram 1
- MT930B Block Diagram 2
- MT930B Block Diagram 3
- MT930B Block Diagram 4

Use these when following the discussion on principles of operation in Chapter 5.

Wiring Diagram

Schematics

- MT930B Head Phone Schematic
- MT930B RF PC Board Schematic
- MT930B Converter Module Schematic
- MT930B Main PC Board (Sheet 1 of 3)
- MT930B Main PC Board (Sheet 2 of 3)
- MT930B Main PC Board (Sheet 3 of 3)
- MT930B Power Supply Schematic
- MT930B IF Filter Block Schematic
- MT930B Audio IF PB01 Schematic
- MT930B Audio Out Schematic
- MT930B Audio PW01 PC Board
- MT930B LCD Module Schematic
- MT930B Microprocessor PC Board Schematic

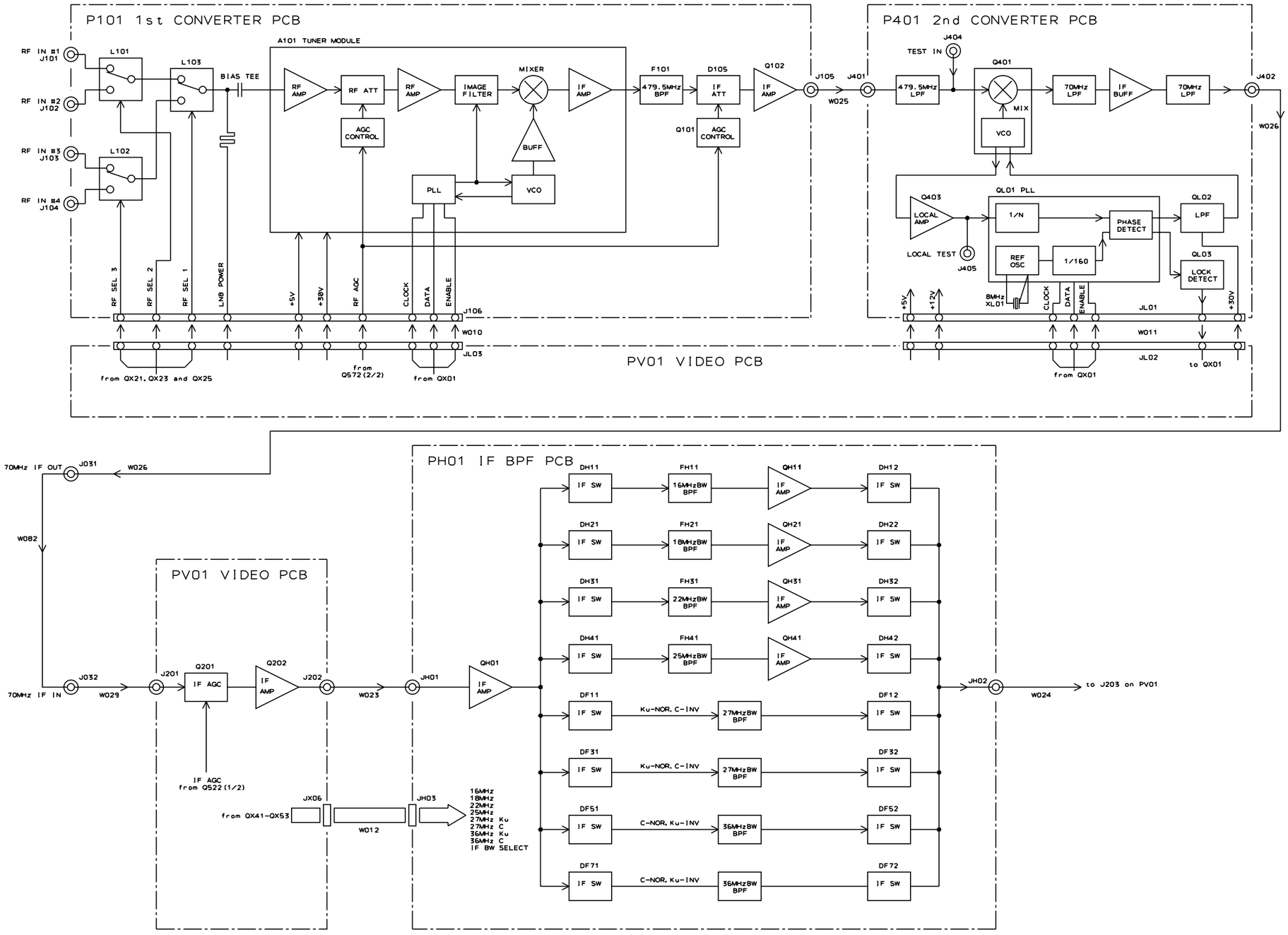

Figure 9-1. MT930B Block Diagram 1

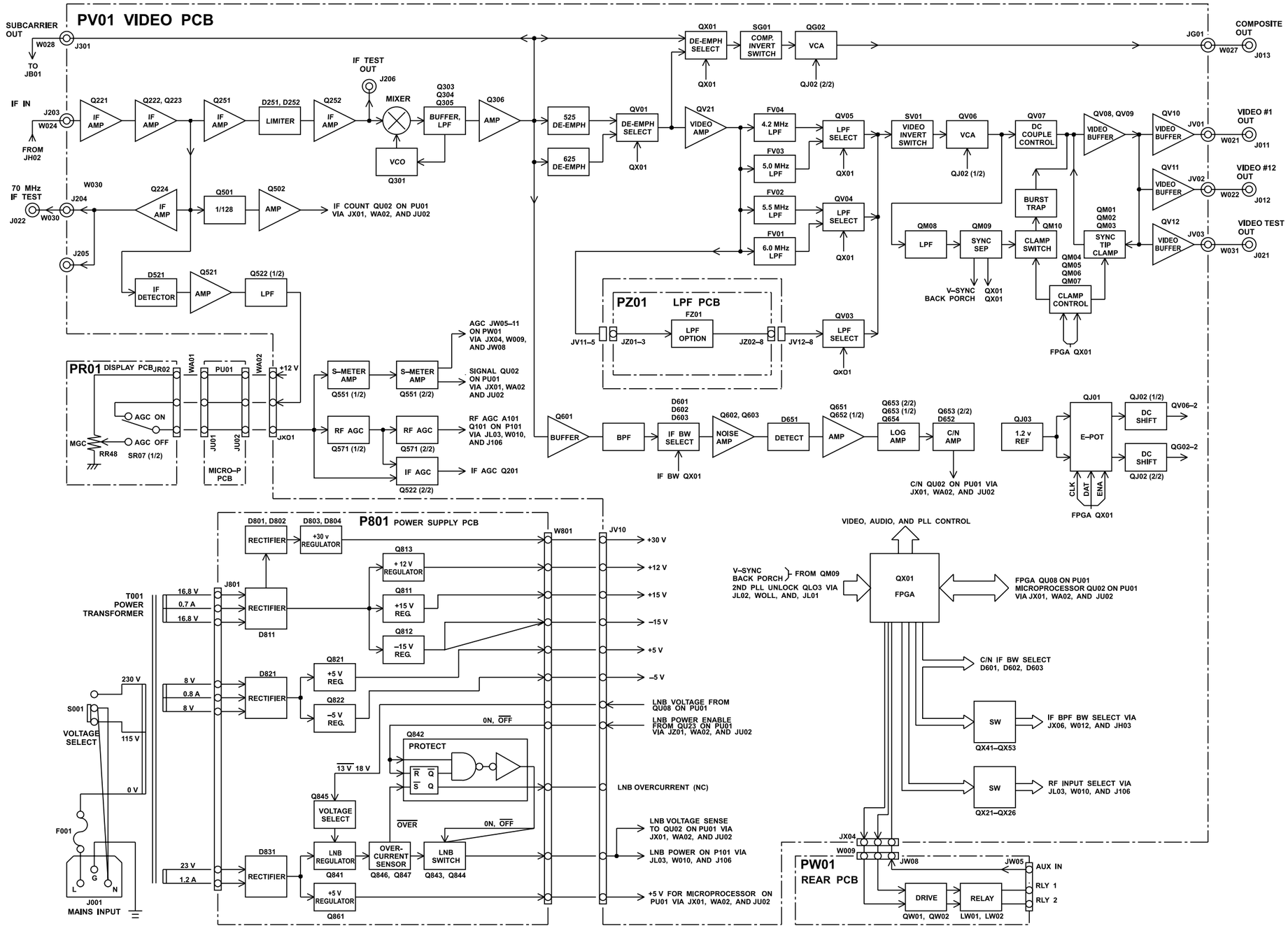

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Figure 9-2. MT930B Block Diagram 2

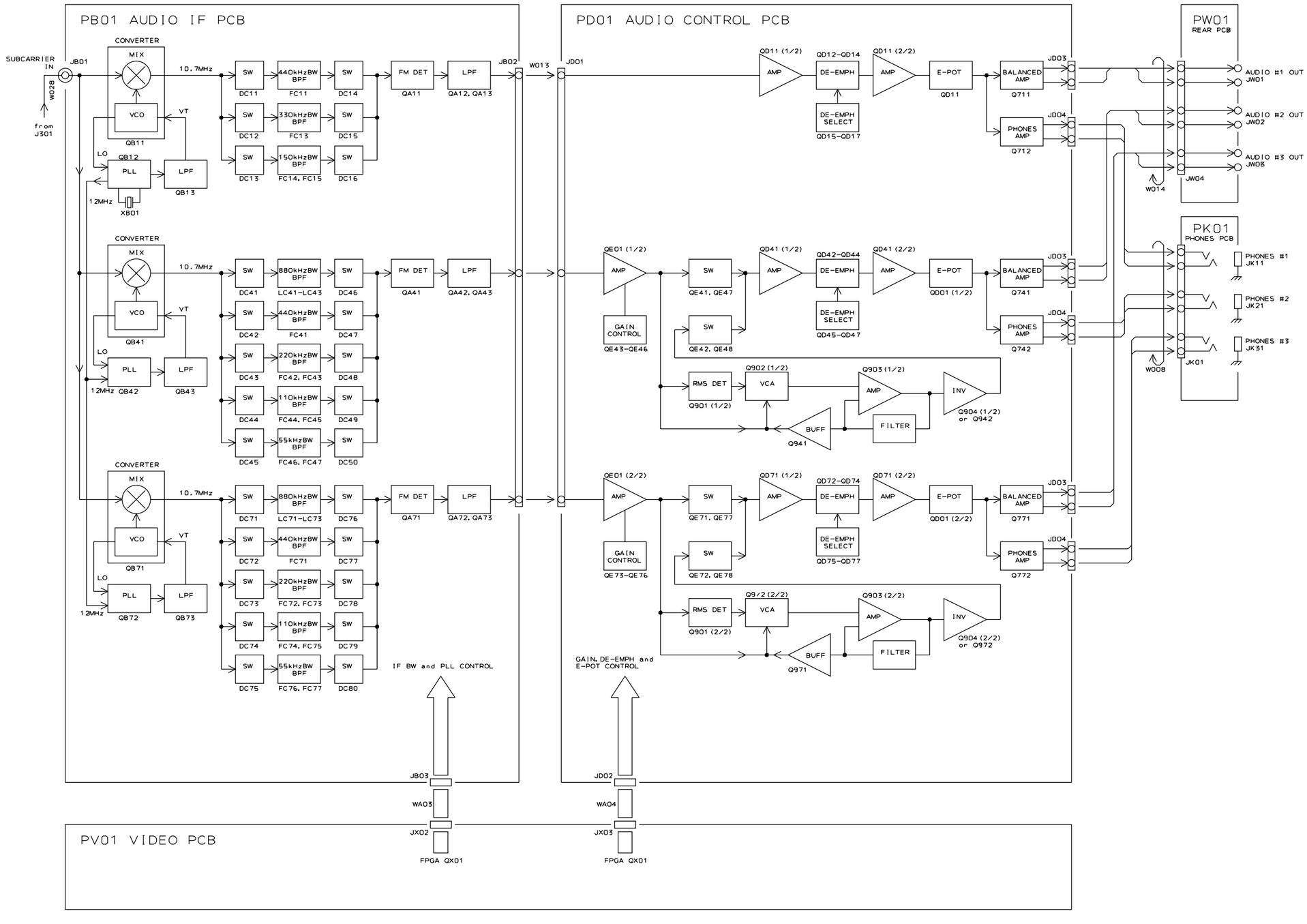

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Figure 9-3. MT930B Block Diagram 3

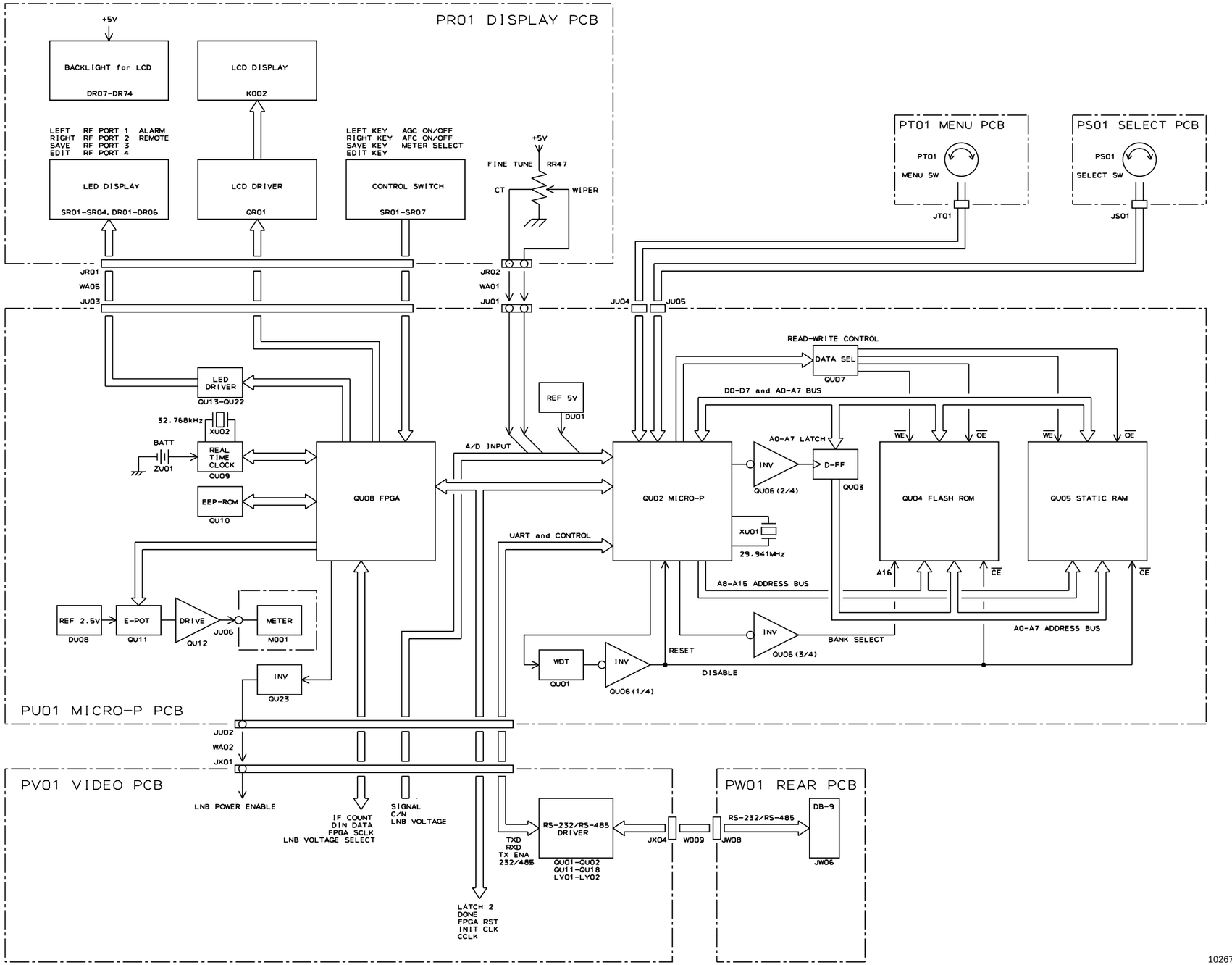

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Figure 9-4. MT930B Block Diagram 4

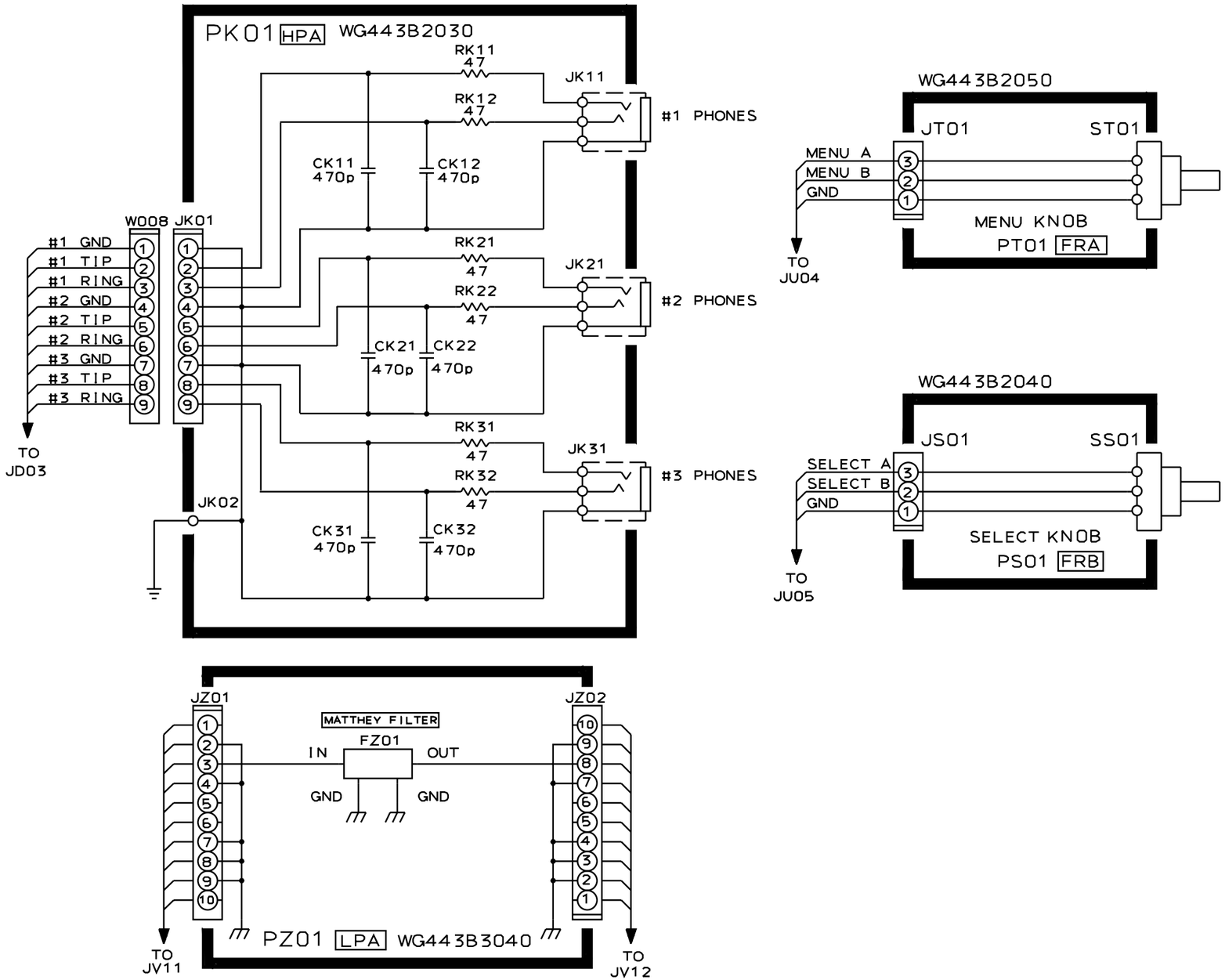

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Figure 9-5. MT930B Head Phone Schematic

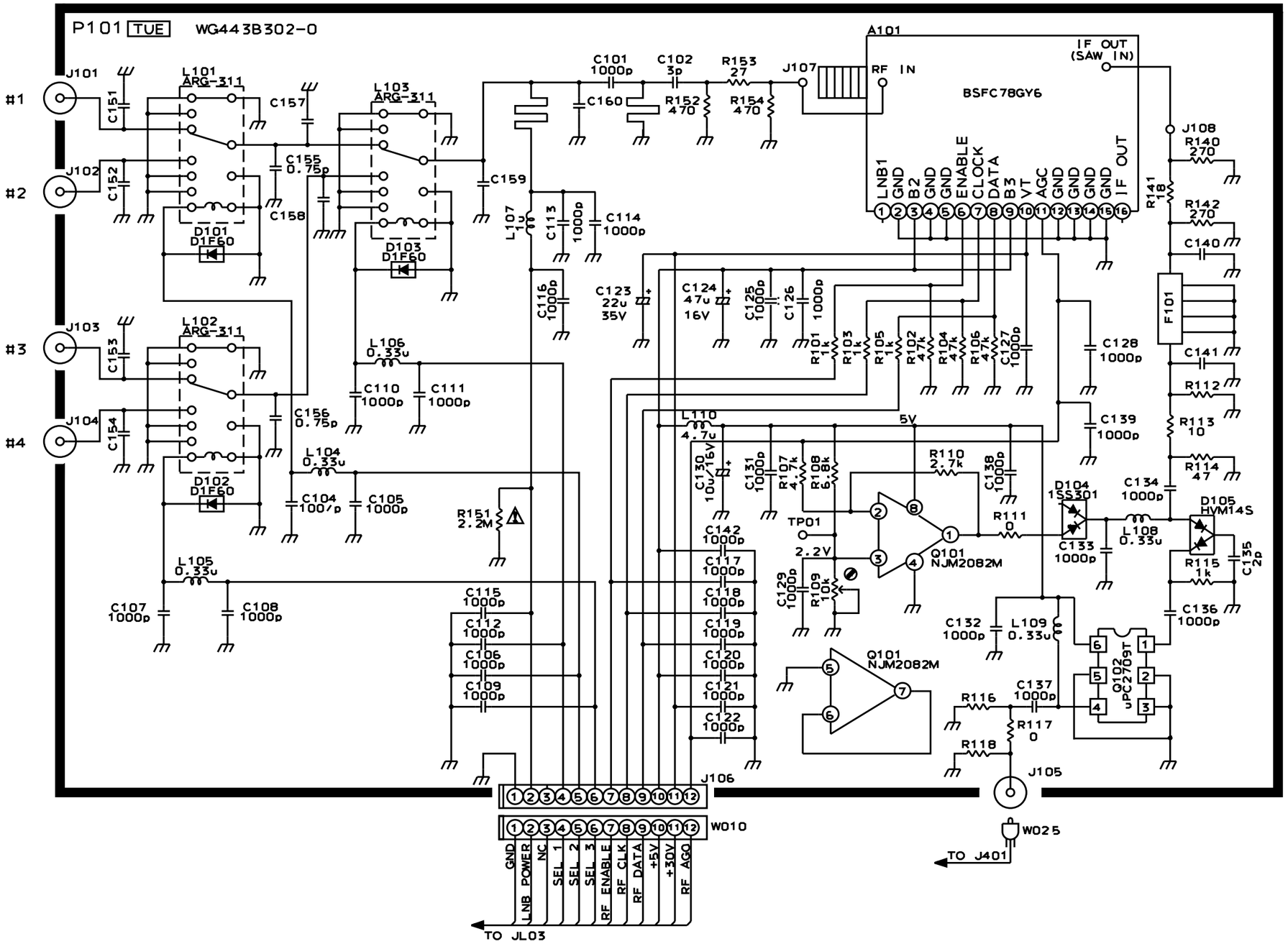

Figure 9-6. MT930B RF PC Board Schematic

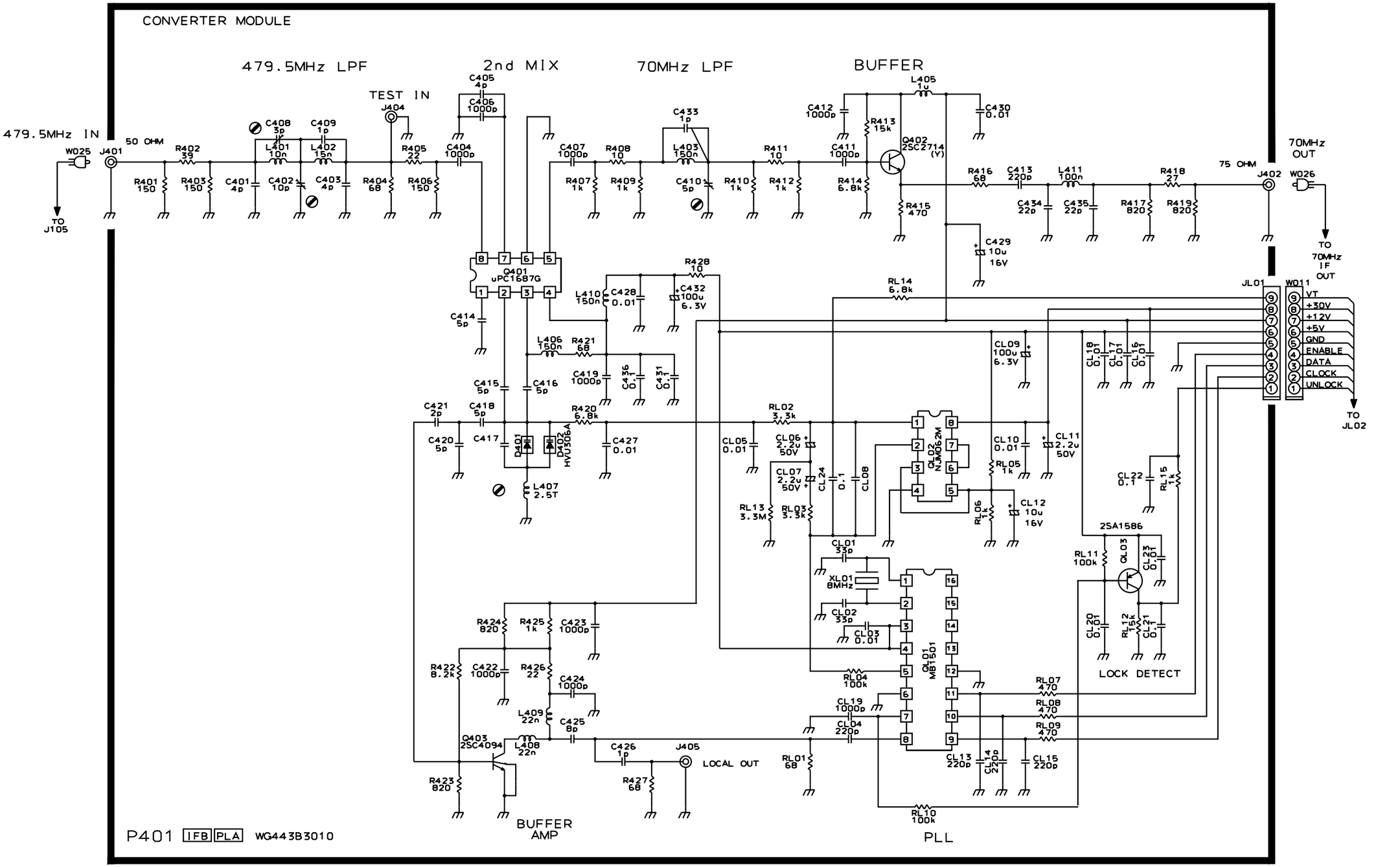

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Figure 9-7. MT930B Converter Module Schematic

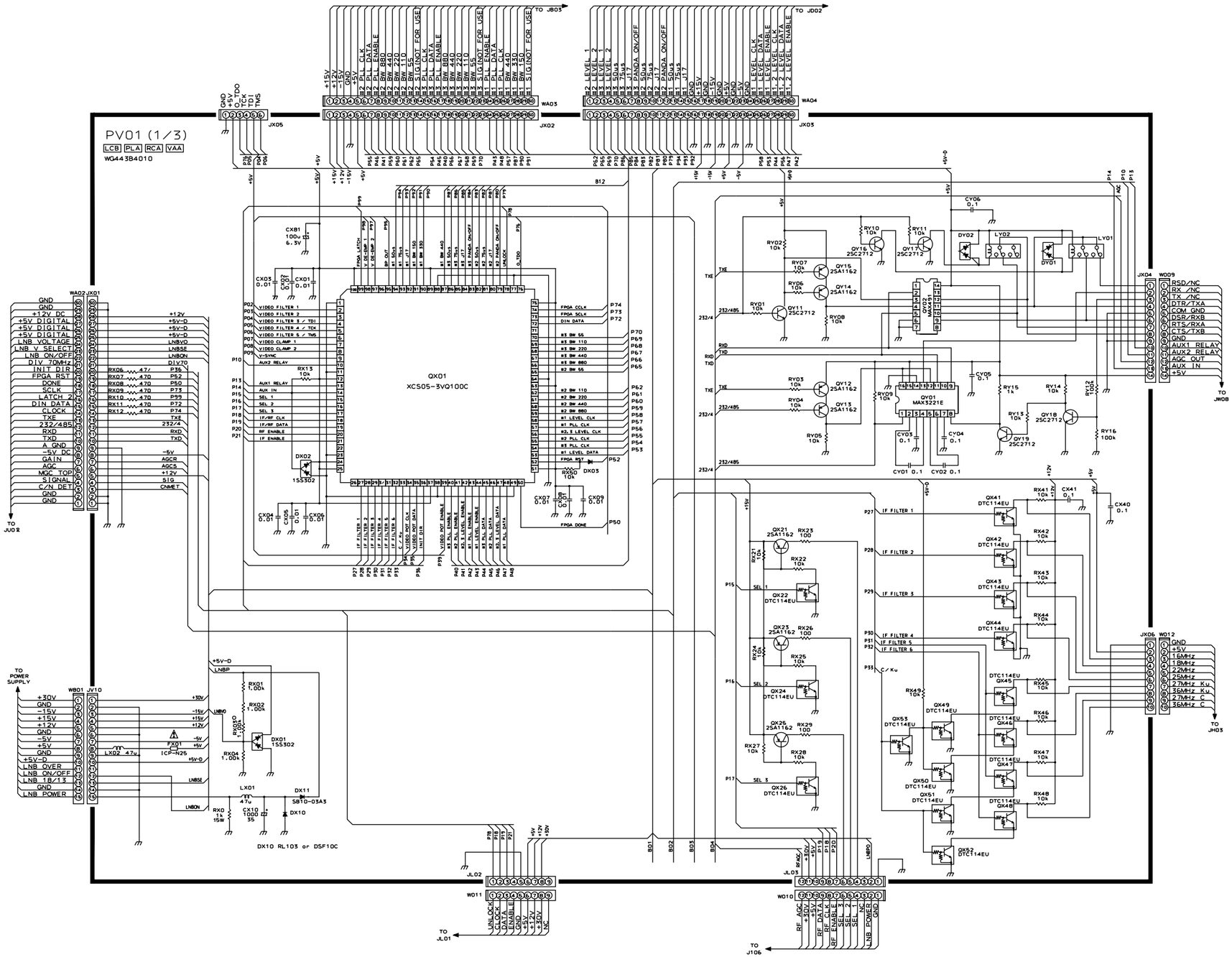

Figure 9-8. MT930B Main PC Board (Sheet 1 of 3)

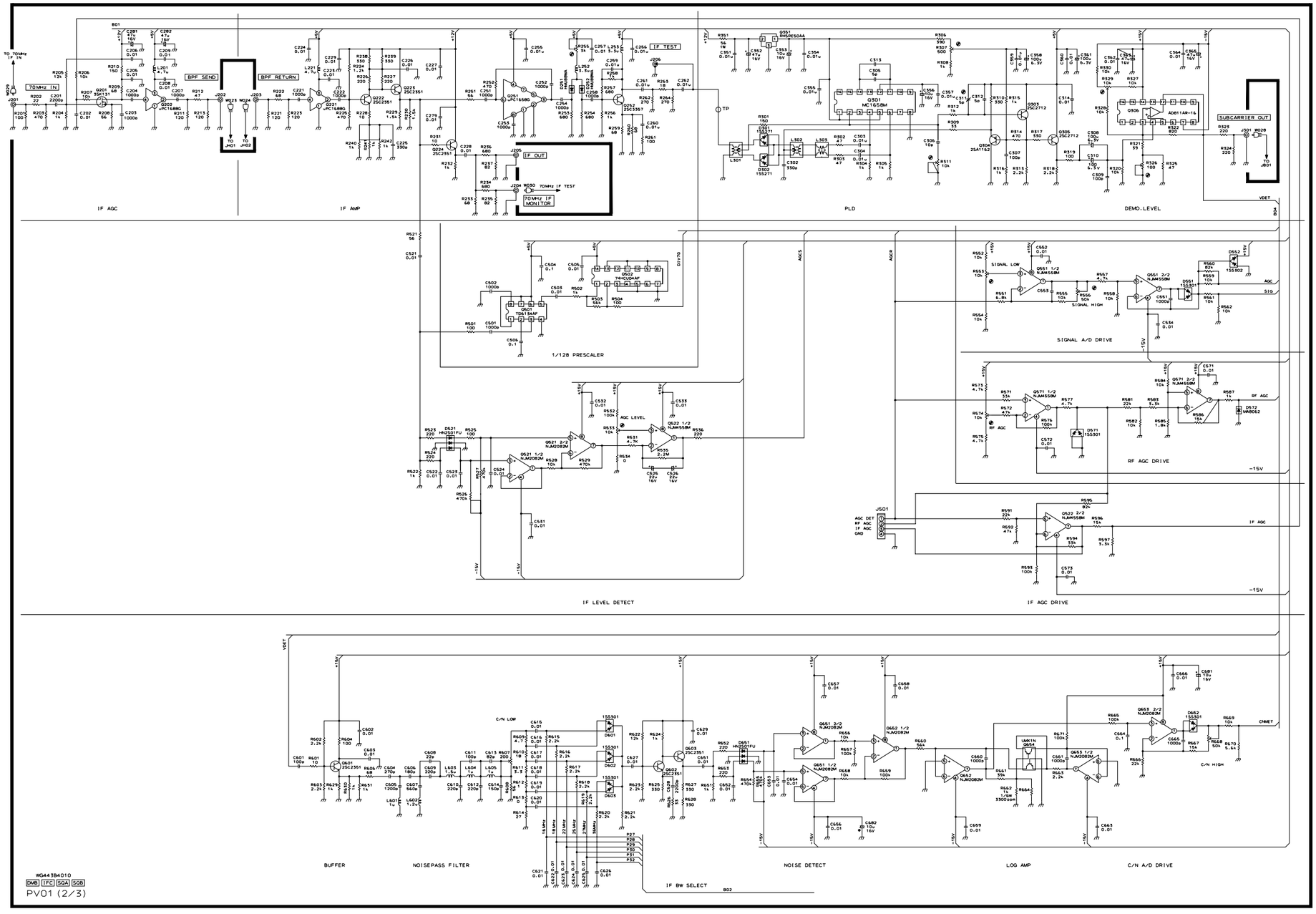

Figure 9-9. MT930B Main PC Board (Sheet 2 of 3)

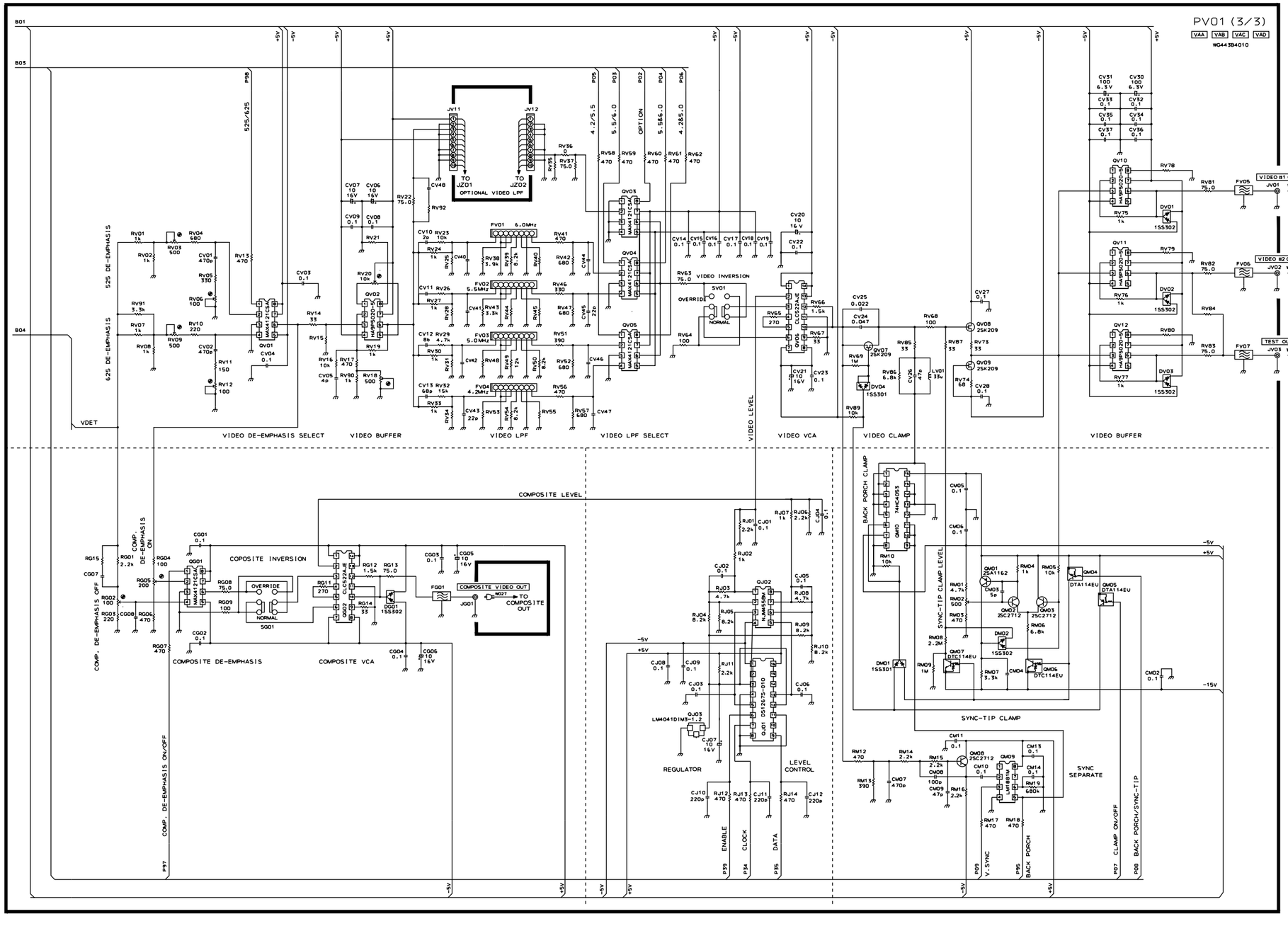

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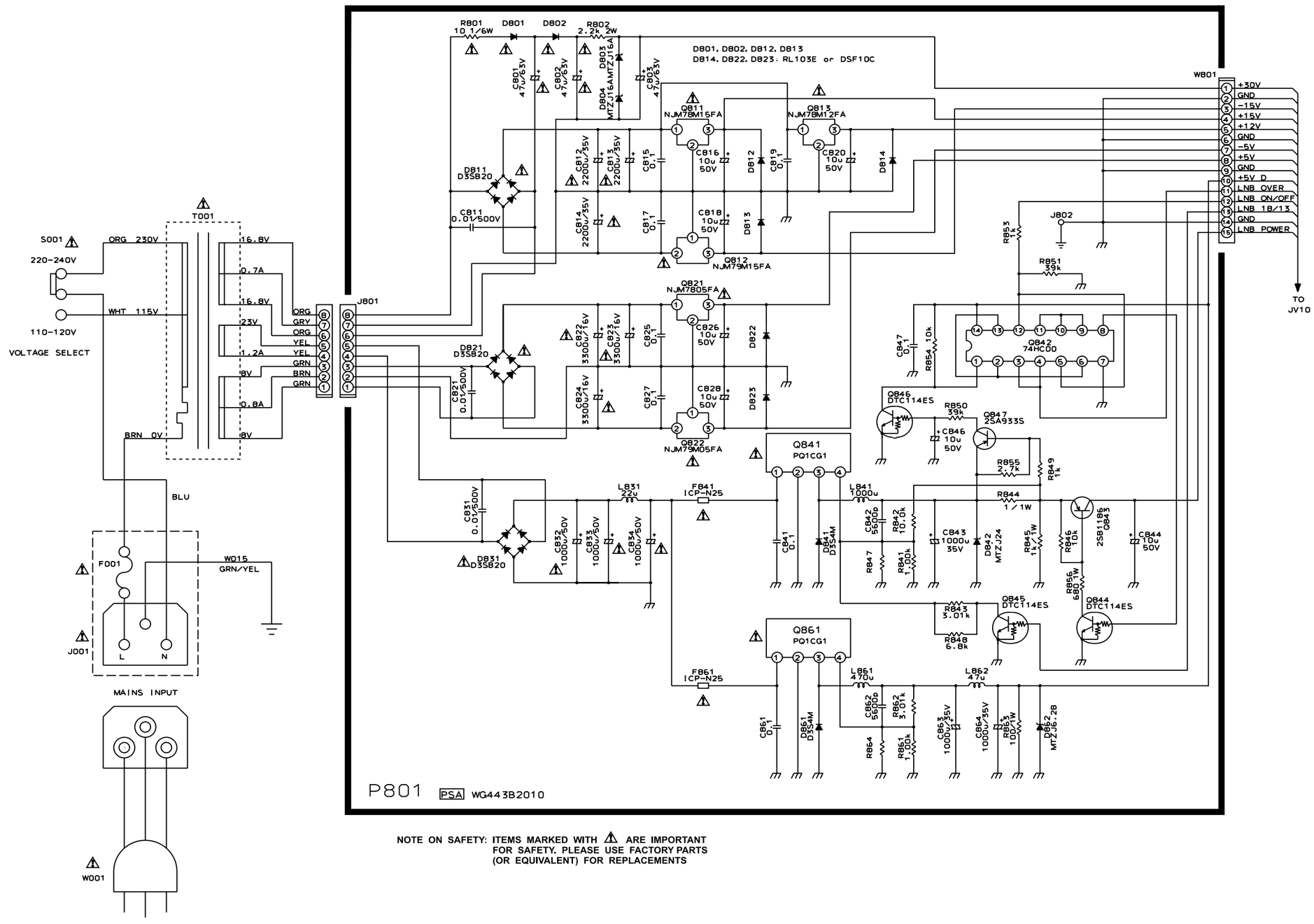
Figure 9-10. MT930B Main PC Board (Sheet 3 of 3)



NOTE ON SAFETY: ITEMS MARKED WITH ⚠ ARE IMPORTANT FOR SAFETY. PLEASE USE FACTORY PARTS (OR EQUIVALENT) FOR REPLACEMENTS

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Figure 9-11. MT930B Power Supply Schematic

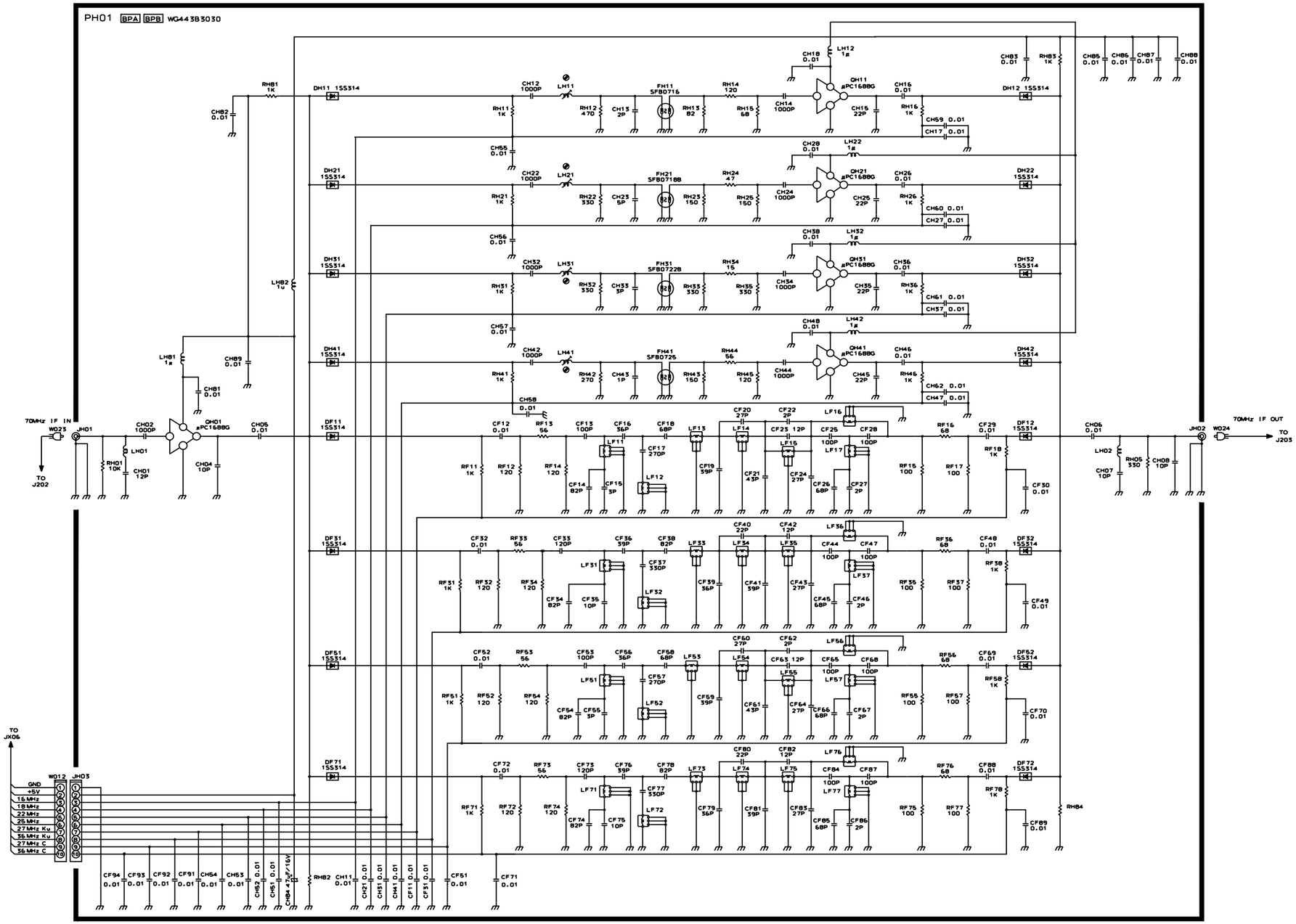

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Figure 9-12. MT930B IF Filter Block Schematic

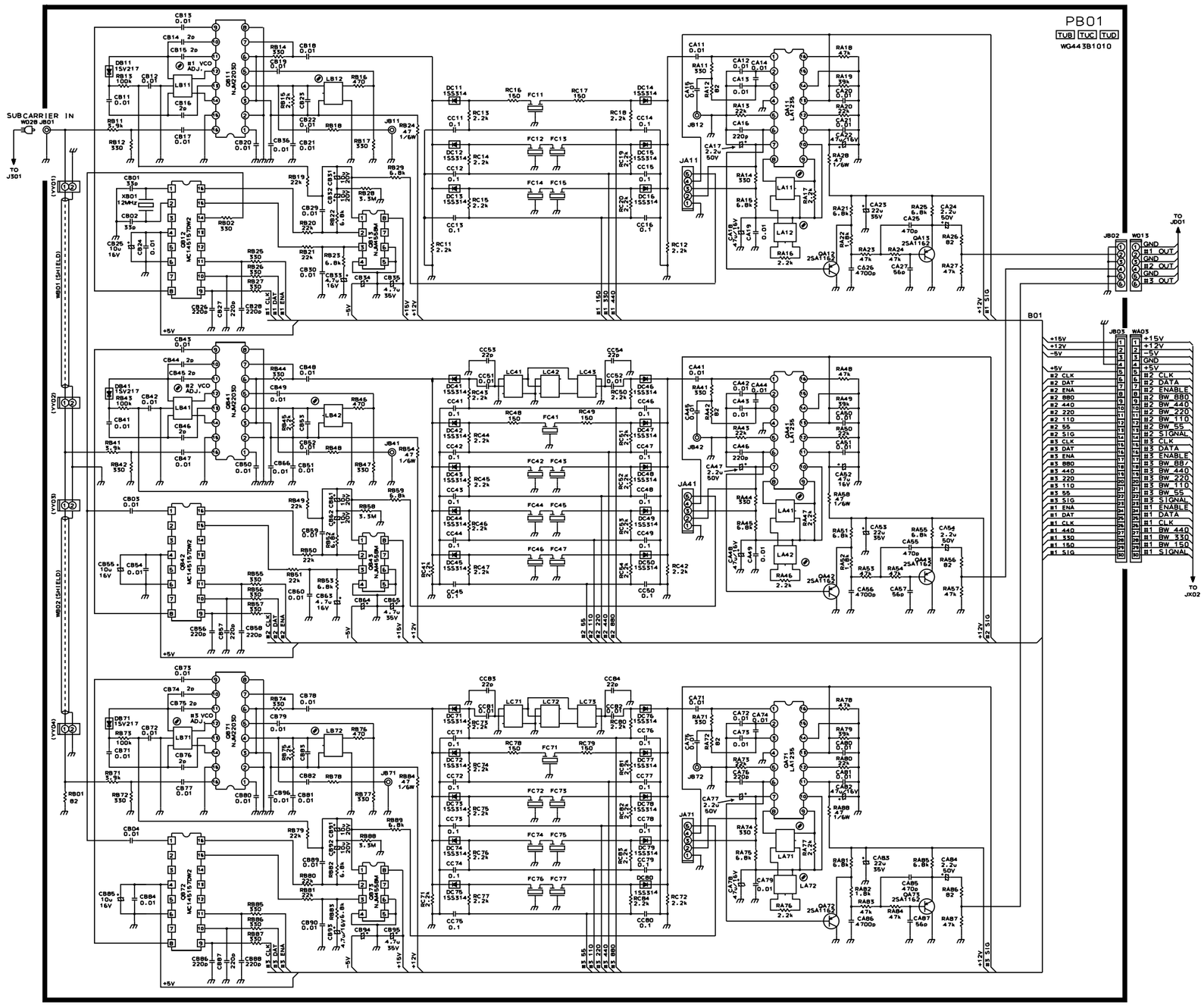

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Figure 9-13. MT930B Audio IF PB01 Schematic

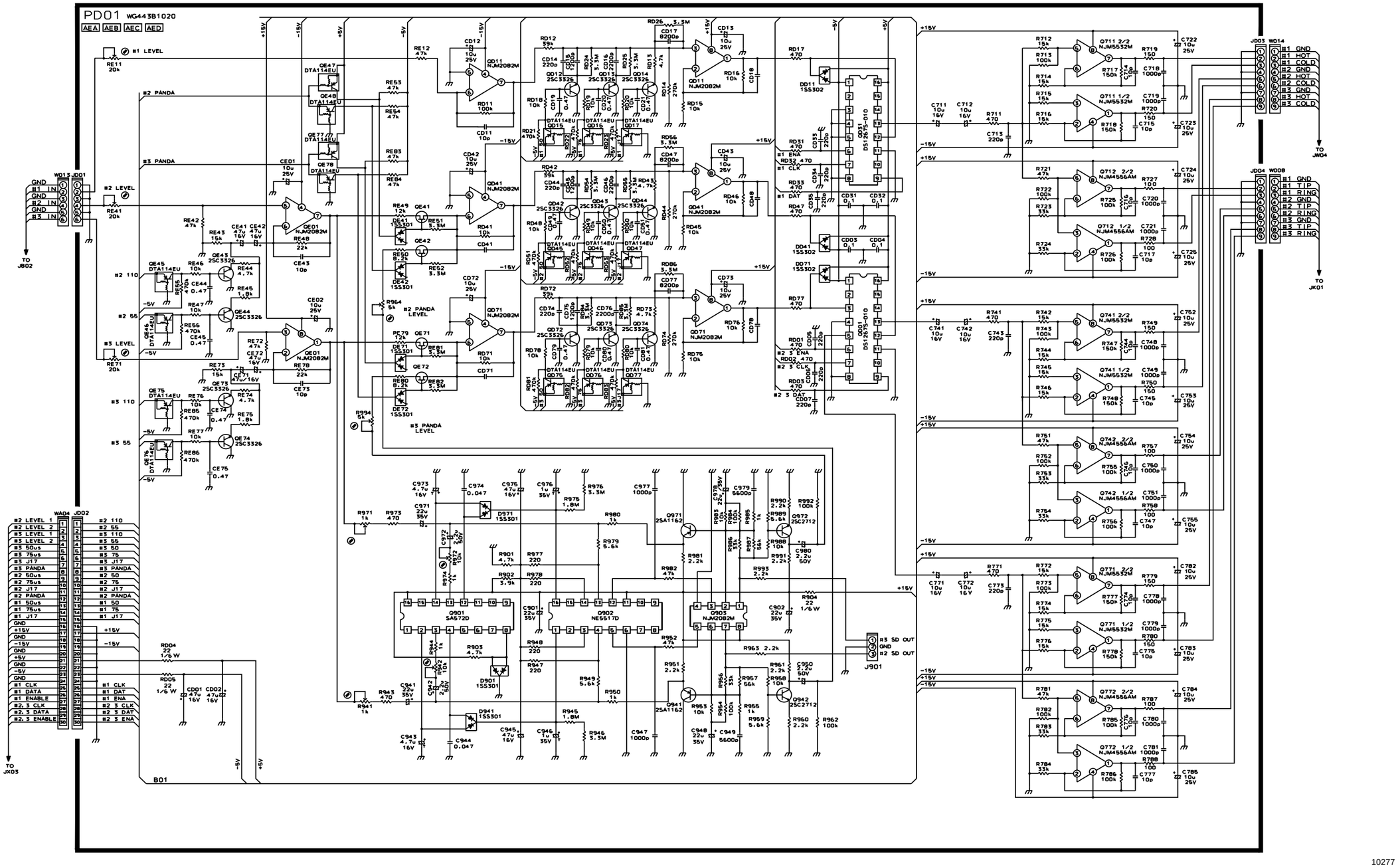

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Figure 9-14. MT930B Audio Out Schematic

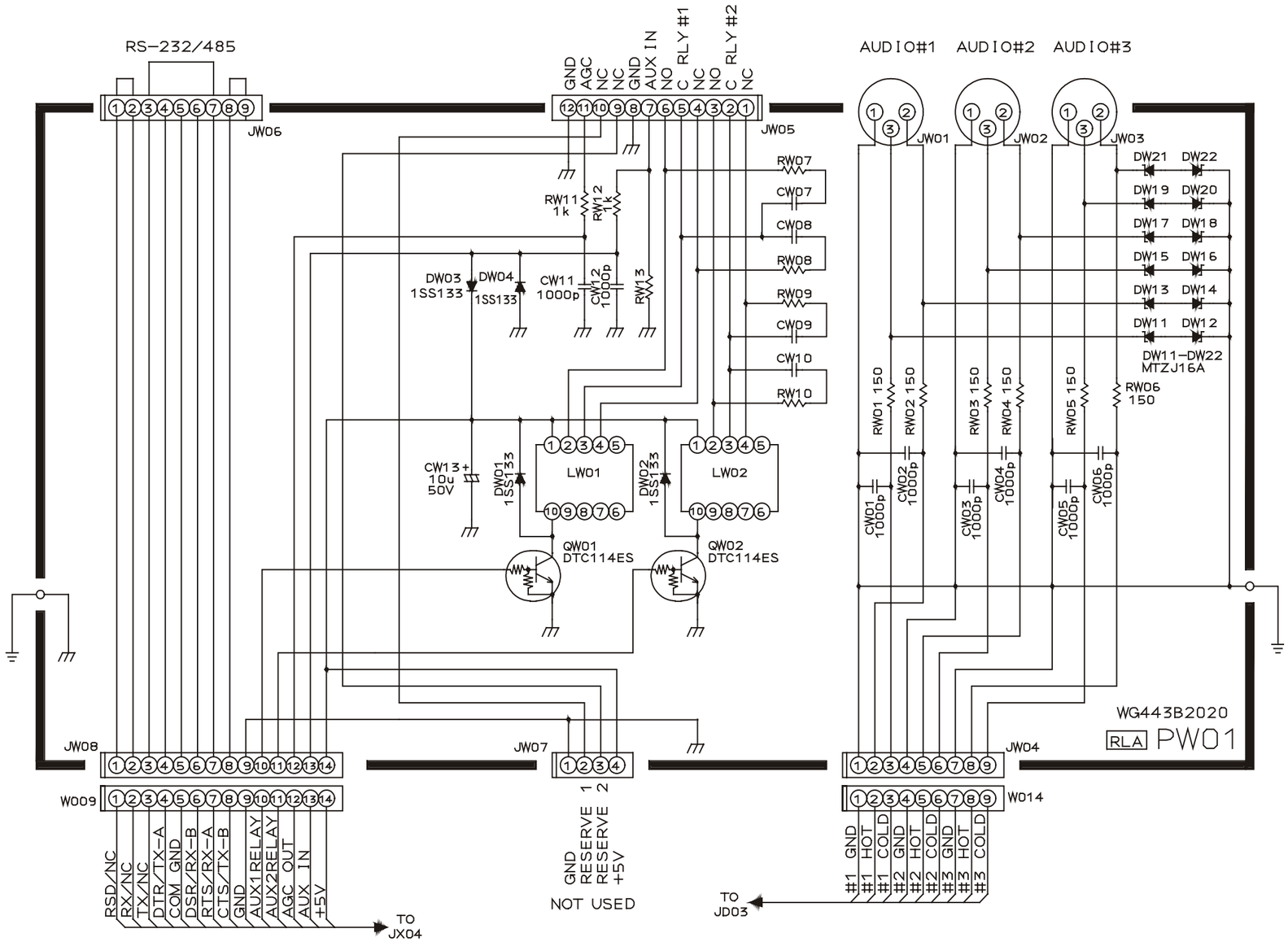
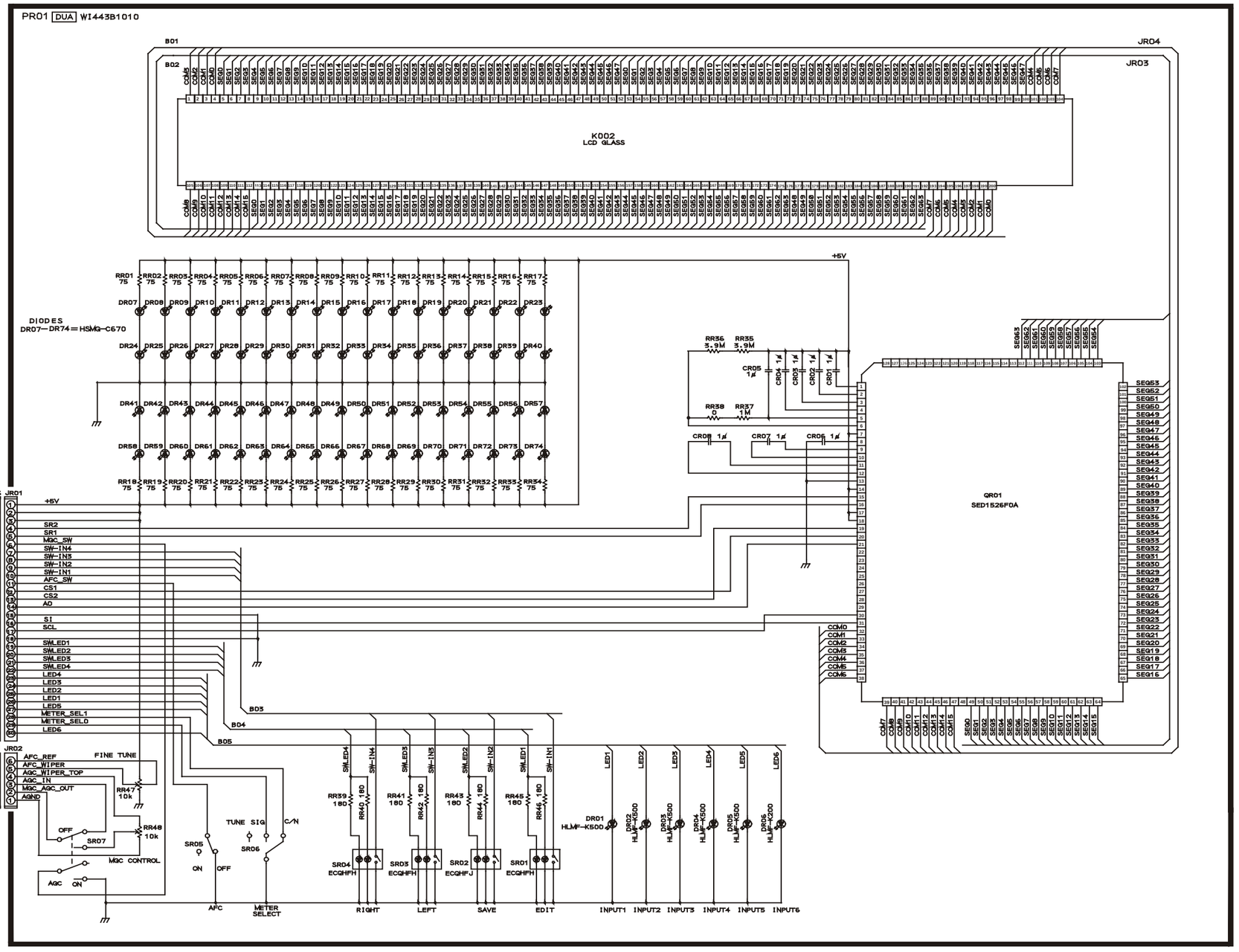
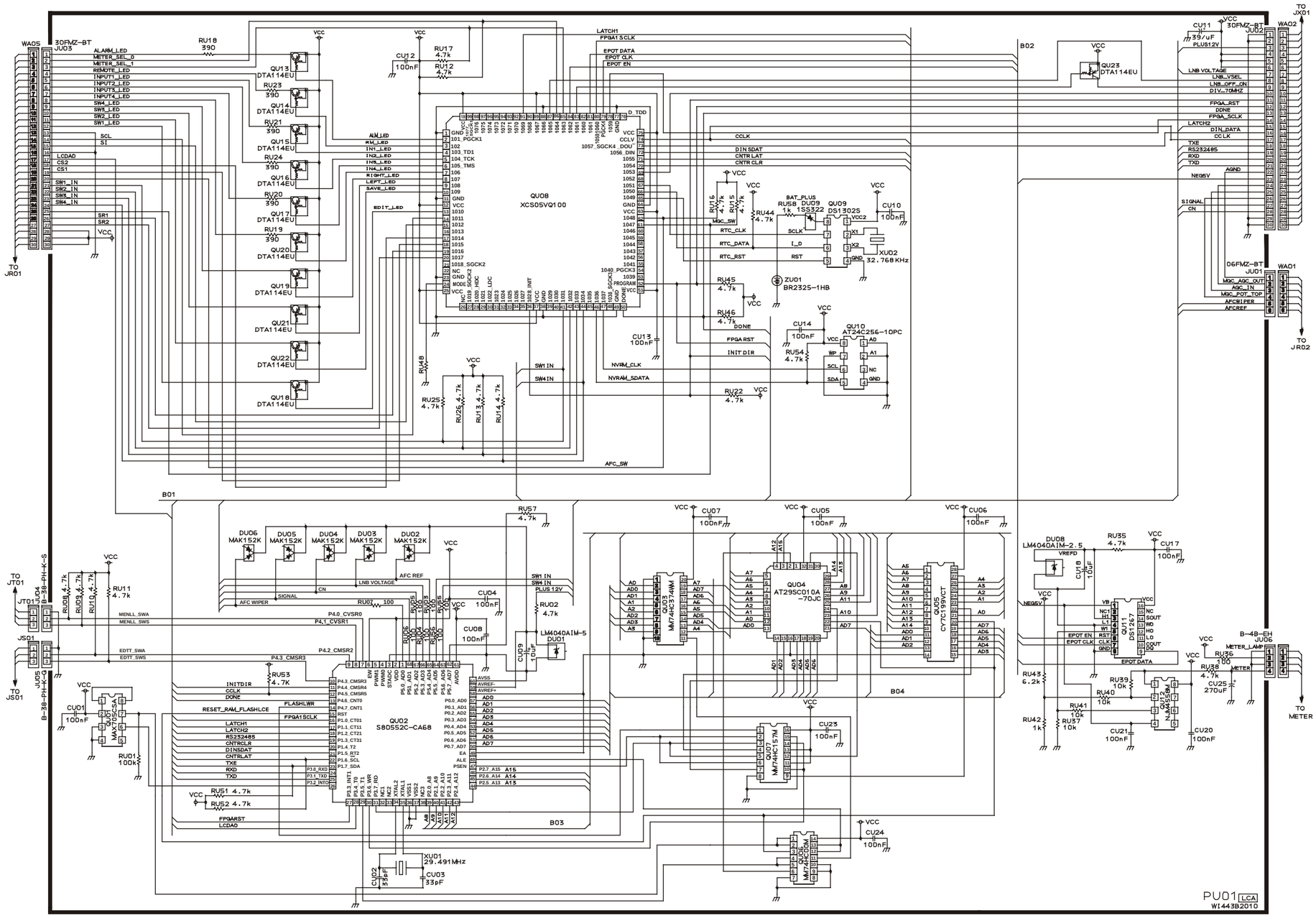

RS-232/485
JW06
GND AGC NC NC GND AUX IN NO C RLY#1 NC NO C RLY#2 NC
JW05
AUDIO#1 AUDIO#2 AUDIO#3
JW01 JW02 JW03
RW07 CW07 CW08 RW08 RW09 CW09 CW10 RW10
RW11 1k RW12 1k
DW03 1SS133 DW04 1SS133
CW11 1000p CW12 1000p RW13
CW13+ 10u 50V
DW01 1SS133 DW02 1SS133
LW01 LW02
QW01 DTC114ES QW02 DTC114ES
DW21 DW22 DW19 DW20 DW17 DW18 DW15 DW16 DW13 DW14 DW11 DW12
DW11-DW22 MTZJ16A
RW01 150 RW02 150 RW03 150 RW04 150 RW05 150 RW06 150
CW01 1000p CW02 1000p CW03 1000p CW04 1000p CW05 1000p CW06 1000p
WG443B2020
RLA PW01
JW08 JW07 JW04
W009 W014
RSD/NC RX/NC TX/NC DTR/TX-A COM GND DSR/RX-B RTS/RX-A CTS/TX-B GND AUX1RELAY AUX2RELAY AGC OUT AUX IN +5V
TO JX04
GND RESERVE RESERVE +5V
NOT USED
#1 GND #1 HOT #1 COLD #2 GND #2 HOT #2 COLD #3 GND #3 HOT #3 COLD
TO JD03
10278

Figure 9-15. MT930B Audio PW01 PC Board Schematic



10279

Figure 9-16. MT930B LCD Module Schematic



10280

Figure 9-17. MT930B Microprocessor PC Board Schematic

CHAPTER 10

PARTS LIST

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER

CAPACITORS

C101			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C102			Capacitor, Ceramic 3 pF ± 0.25 pF	DD90030300
C104			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C105			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C106			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C107			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C108			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C109			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C110			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C111			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C112			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C113			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C114			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C115			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C116			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C117			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C118			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C119			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C120			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C121			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C122			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C123			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C124			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C125			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C126			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C127			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C128			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C129			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C130			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C131			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C132			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C133			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C134			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C135			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
C136			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C137			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C138			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C139			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C142			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C155			Capacitor, Ceramic 0.8 pF ± 0.25 pF	DD50008300
C156			Capacitor, Ceramic 0.8 pF ± 0.25 pF	DD50008300
C201			Capacitor, Ceramic 2200 pF ± 10%	DK96222300
C202			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C203			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C204			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C205			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C206			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C207			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C208			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C209			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C221			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C222			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C223			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C224			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C225			Capacitor, Ceramic 330 pF ± 5%	DD95331300

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
C226			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C227			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C228			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C229			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C251			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C252			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C253			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C254			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C255			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C256			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C257			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C258			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C259			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C260			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C261			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C262			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C279			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C281			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C282			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C302			Capacitor, Ceramic 330 pF ± 5%	DD95331300
C303			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C304			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C305			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C306			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C307			Capacitor, Ceramic 100 pF ± 5%	DD95101300
C308			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
C309			Capacitor, Ceramic 100 pF ± 5%	DD95101300
C310			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
C311			Capacitor, Trimmer, Chip 5 pF	CX10500020
C312			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C314			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C351			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C352			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C353			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C354			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C355			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C356			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C357			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C358			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
C359			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C360			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C361			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
C362			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C363			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C364			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C365			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C401			Capacitor, Ceramic 4 pF ± 0.25 pF	DD90040300
C402			Capacitor, Trimmer, Chip 10 pF CTZ05A	CX11000020
C403			Capacitor, Ceramic 4 pF ± 0.25 pF	DD90040300
C404			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C405			Capacitor, Ceramic 4 pF ± 0.25 pF	DD90040300
C406			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C407			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C408			Capacitor, Trimmer, Chip 3 pF CTZ-03A	CX10300020
C409			Capacitor, Ceramic 1 pF ±0.25 pF	DD90010300
C410			Capacitor, Trimmer, Chip 5 pF CTZ05A	CX10500020
C411			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C412			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C413			Capacitor, Ceramic 220 pF ± 10%	DK96221300
C414			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C415			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
C416			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C418			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C419			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C420			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
C421			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
C422			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C423			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C424			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C425			Capacitor, Ceramic 8 pF ± 0.5 pF	DD91080300
C426			Capacitor, Ceramic 1 pF ± 0.25 pF	DD90010300
C427			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C428			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C429			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C430			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C431			Capacitor, Ceramic 0.1 µF	DK98104200
C432			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
C433			Capacitor, Ceramic 1 pF ± 0.25 pF	DD90010300
C434			Capacitor, Ceramic 22 pF ± 5%	DD95220300
C435			Capacitor, Ceramic 22 pF ± 5%	DD95220300
C436			Capacitor, Ceramic 0.1 µF	DK98104200
C501			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C502			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C503			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C504			Capacitor, Ceramic 0.1 µF	DK98104200
C505			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C506			Capacitor, Ceramic 0.1 µF	DK98104200
C521			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C522			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C523			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C524			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C525			Capacitor, Tantalum Chip 22 µF 16 V	EY22601660
C526			Capacitor, Tantalum Chip 22 µF 16 V	EY22601660
C531			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C532			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C533			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C534			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C551			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C552			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C571			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C572			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C573			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C601			Capacitor, Ceramic 100 pF ± 5%	DD95101300
C602			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C603			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C604			Capacitor, Ceramic 270 pF ± 5%	DD95271300
C605			Capacitor, Ceramic 1200 pF ± 10%	DK96122300
C606			Capacitor, Ceramic 180 pF ± 5%	DD95181300
C607			Capacitor, Ceramic 560 pF ± 10%	DK96561300
C608			Capacitor, Ceramic 22 pF ± 5%	DD95220300
C609			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C610			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C611			Capacitor, Ceramic 100 pF ± 5%	DD95101300
C612			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C613			Capacitor, Ceramic 82 pF ± 5%	DD95820300
C614			Capacitor, Ceramic 150 pF ± 5%	DD95151300
C615			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C616			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C617			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C618			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C619			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
C620			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C621			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C622			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C623			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C624			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C625			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C626			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C627			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C628			Capacitor, Ceramic 2200 pF ± 10%	DK96222300
C629			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C651			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C652			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C653			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C654			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C656			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C657			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C658			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C659			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C660			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C661			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C663			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C664			Capacitor, Ceramic 0.1 µF	DK98104200
C665			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C666			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
C681			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C682			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C711			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C712			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C713			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C714			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C715			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C716			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C717			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C718			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C719			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C720			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C721			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C722			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C723			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C724			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C725			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C741			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C742			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C743			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C744			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C745			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C746			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C747			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C748			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C749			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C750			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C751			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C752			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C753			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C754			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C755			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C771			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C772			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
C773			Capacitor, Ceramic 220 pF ± 5%	DD95221300
C774			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C775			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
C776			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C777			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
C778			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C779			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C780			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C781			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C782			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C783			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C784			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C785			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
C801			Capacitor, Electrolytic, Chip 47 µF 63 V	EA47606320
C802			Capacitor, Electrolytic, Chip 47 µF 63 V	EA47606320
C803			Capacitor, Electrolytic, Chip 47 µF 63 V	EA47606320
C811			Capacitor, Ceramic 0.01 µF ± 10%	DK16103550
C812			Capacitor, Electrolytic 2200 µF 25 V	EA22802520
C813			Capacitor, Electrolytic 2200 µF 25 V	EA22802520
C814			Capacitor, Electrolytic 2200 µF 25 V	EA22802520
C815			Capacitor, Film 0.1 µF ± 5%	DF15104350
C816			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C817			Capacitor, Film 0.1 µF ± 5%	DF15104350
C818			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C819			Capacitor, Film 0.1 µF ± 5%	DF15104350
C820			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C821			Capacitor, Ceramic 0.01 µF ± 10%	DK16103550
C822			Capacitor, Electrolytic 3300 µF 16 V	EA33801620
C823			Capacitor, Electrolytic 3300 µF 16 V	EA33801620
C824			Capacitor, Electrolytic 3300 µF 16 V	EA33801620
C825			Capacitor, Film 0.1 µF ± 5%	DF15104350
C826			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C827			Capacitor, Film 0.1 µF ± 5%	DF15104350
C828			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C831			Capacitor, Ceramic 0.01 µF ± 10%	DK16103550
C832			Capacitor, Electrolytic 1000 µF 50 V	EA10805020
C833			Capacitor, Electrolytic 1000 µF 50 V	EA10805020
C834			Capacitor, Electrolytic 1000 µF 50 V	EA10805020
C841			Capacitor, Film 0.1 µF ± 5%	DF15104350
C842			Capacitor, Film 5600 pF ± 5%	DF15562350
C843			Capacitor, Electrolytic 1000 µF 35 V	EA10803520
C844			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C846			Capacitor, Electrolytic 10 µF 50 V	EA10605020
C847			Capacitor, Film 0.1 µF ± 5%	DF15104350
C861			Capacitor, Film 0.1 µF ± 5%	DF15104350
C862			Capacitor, Film 5600 pF ± 5%	DF15562350
C863			Capacitor, Electrolytic 1000 µF 35 V	EA10803520
C864			Capacitor, Electrolytic 1000 µF 35 V	EA10803520
C901			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C902			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C941			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C942			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
C943			Capacitor, Tantalum Chip 4.7 µF 16 V	EY47501630
C944			Capacitor, Mica 0.047 µF ± 5%	DF95473060
C945			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C946			Capacitor, Tantalum Chip 1 µF 35 V	EY10503530
C947			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C948			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C949			Capacitor, Mica 5600 pF ± 5%	DF95562050
C950			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
C971			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C972			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
C973			Capacitor, Tantalum Chip 4.7 µF 16 V	EY47501630

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
C974			Capacitor, Mica 0.047 µF ± 5%	DF95473060
C975			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
C976			Capacitor, Tantalum Chip 1 µF 35 V	EY10503530
C977			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
C978			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
C979			Capacitor, Mica 5600 pF ± 5%	DF95562050
C980			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA01			Capacitor, Ceramic 27 pF ± 5%	DD95270300
CA11			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA12			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA13			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA14			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA15			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA16			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CA17			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA18			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA19			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA20			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA21			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA22			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA23			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
CA24			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA25			Capacitor, Ceramic 470 pF ± 10%	DK96471300
CA26			Capacitor, Mica 4700 pF ± 5%	DF95472050
CA27			Capacitor, Ceramic 56 pF ± 5%	DD95560300
CA41			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA42			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA43			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA44			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA45			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA46			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CA47			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA48			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA49			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA50			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA51			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA52			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA53			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
CA54			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA55			Capacitor, Ceramic 470 pF ± 10%	DK96471300
CA56			Capacitor, Mica 4700 pF ± 5%	DF95472050
CA57			Capacitor, Ceramic 56 pF ± 5%	DD95560300
CA71			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA72			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA73			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA74			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA75			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA76			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CA77			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA78			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA79			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA80			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA81			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CA82			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CA83			Capacitor, Tantalum Chip 22 µF 35 V	EY22603560
CA84			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CA85			Capacitor, Ceramic 470 pF ± 10%	DK96471300
CA86			Capacitor, Mica 4700 pF ± 5%	DF95472050
CA87			Capacitor, Ceramic 56 pF ± 5%	DD95560300
CB01			Capacitor, Ceramic 33 pF ± 5%	DD95330300
CB02			Capacitor, Ceramic 33 pF ± 5%	DD95330300

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CB03			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB04			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB11			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB12			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB13			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB14			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB15			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB16			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB17			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB18			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB19			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB20			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB21			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB24			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB25			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CB26			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB27			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB28			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB29			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB30			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB31			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB32			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB33			Capacitor, Tantalum Chip 4.7 µF 16 V	EY47501630
CB35			Capacitor, Tantalum Chip 4.7 µF 35 V	EY47503560
CB36			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB41			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB42			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB43			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB44			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB45			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB46			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB47			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB48			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB49			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB50			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB51			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB54			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB55			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CB56			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB57			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB58			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB59			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB60			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB61			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB62			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB63			Capacitor, Tantalum Chip 4.7 µF 16 V	EY47501630
CB65			Capacitor, Tantalum Chip 4.7 µF 35 V	EY47503560
CB66			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB71			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB72			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB73			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB74			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB75			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB76			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CB77			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB78			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB79			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB80			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB81			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB84			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CB85			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CB86			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB87			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB88			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CB89			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB90			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CB91			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB92			Capacitor, Tantalum Chip 10 µF 20 V	EY10602070
CB93			Capacitor, Tantalum Chip 4.7 µF 16 V	EY47501630
CB95			Capacitor, Tantalum Chip 4.7 µF 35 V	EY47503560
CB96			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CC11			Capacitor, Ceramic 0.1 µF	DK98104200
CC12			Capacitor, Ceramic 0.1 µF	DK98104200
CC13			Capacitor, Ceramic 0.1 µF	DK98104200
CC14			Capacitor, Ceramic 0.1 µF	DK98104200
CC15			Capacitor, Ceramic 0.1 µF	DK98104200
CC16			Capacitor, Ceramic 0.1 µF	DK98104200
CC41			Capacitor, Ceramic 0.1 µF	DK98104200
CC42			Capacitor, Ceramic 0.1 µF	DK98104200
CC43			Capacitor, Ceramic 0.1 µF	DK98104200
CC44			Capacitor, Ceramic 0.1 µF	DK98104200
CC45			Capacitor, Ceramic 0.1 µF	DK98104200
CC46			Capacitor, Ceramic 0.1 µF	DK98104200
CC47			Capacitor, Ceramic 0.1 µF	DK98104200
CC48			Capacitor, Ceramic 0.1 µF	DK98104200
CC49			Capacitor, Ceramic 0.1 µF	DK98104200
CC50			Capacitor, Ceramic 0.1 µF	DK98104200
CC51			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CC52			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CC53			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CC54			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CC71			Capacitor, Ceramic 0.1 µF	DK98104200
CC72			Capacitor, Ceramic 0.1 µF	DK98104200
CC73			Capacitor, Ceramic 0.1 µF	DK98104200
CC74			Capacitor, Ceramic 0.1 µF	DK98104200
CC75			Capacitor, Ceramic 0.1 µF	DK98104200
CC76			Capacitor, Ceramic 0.1 µF	DK98104200
CC77			Capacitor, Ceramic 0.1 µF	DK98104200
CC78			Capacitor, Ceramic 0.1 µF	DK98104200
CC79			Capacitor, Ceramic 0.1 µF	DK98104200
CC80			Capacitor, Ceramic 0.1 µF	DK98104200
CC81			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CC82			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CC83			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CC84			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CD01			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CD02			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CD03			Capacitor, Ceramic 0.1 µF	DK98104200
CD04			Capacitor, Ceramic 0.1 µF	DK98104200
CD05			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD06			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD07			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD11			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CD12			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD13			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD14			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD15			Capacitor, Mica 1200 pF ± 5%	DF95122040
CD16			Capacitor, Mica 2200 pF ± 5%	DF95222030
CD17			Capacitor, Mica 8200 pF ± 5%	DF95822030
CD19			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD20			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CD21			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD31			Capacitor, Ceramic 0.1 µF	DK98104200
CD32			Capacitor, Ceramic 0.1 µF	DK98104200
CD33			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD34			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD35			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD42			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD43			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD44			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD45			Capacitor, Mica 1200 pF ± 5%	DF95122040
CD46			Capacitor, Mica 2200 pF ± 5%	DF95222030
CD47			Capacitor, Mica 8200 pF ± 5%	DF95822030
CD49			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD50			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD51			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD72			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD73			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CD74			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CD75			Capacitor, Mica 1200 pF ± 5%	DF95122040
CD76			Capacitor, Mica 2200 pF ± 5%	DF95222030
CD77			Capacitor, Mica 8200 pF ± 5%	DF95822030
CD79			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD80			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CD81			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CE01			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CE02			Capacitor, Tantalum Chip 10 µF 25 V	EY10602560
CE41			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CE42			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CE43			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CE44			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CE45			Capacitor, Ceramic 0.47 µF F	DK56474200
CE71			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CE72			Capacitor, Tantalum Chip 47 µF 16 V	EY47601660
CE73			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CE74			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CE75			Capacitor, Ceramic 0.47 µF +30% to –80% (–25 to + 85 °C)	DK56474200
CF11			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF12			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF13			Capacitor, Ceramic 100 pF ± 5%	DD95101300
CF14			Capacitor, Ceramic 82 pF ± 5%	DD95820300
CF15			Capacitor, Ceramic 3 pF ± 0.25 pF	DD90030300
CF16			Capacitor, Ceramic 36 pF ± 5%	DD95360300
CF17			Capacitor, Ceramic 270 pF ± 5%	DD95271300
CF18			Capacitor, Ceramic 68 pF ± 5%	DD95680300
CF19			Capacitor, Ceramic 39 pF ± 5%	DD95390300
CF20			Capacitor, Ceramic 27 pF ± 5%	DD95270300
CF21			Capacitor, Ceramic 43 pF ± 5%	DD95430300
CF22			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CF23			Capacitor, Ceramic 12 pF ± 5%	DD95120300
CF24			Capacitor, Ceramic 27 pF ± 5%	DD95270300
CF25			Capacitor, Ceramic 100 pF ± 5%	DD95101300
CF26			Capacitor, Ceramic 68 pF ± 5%	DD95680300
CF27			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CF28			Capacitor, Ceramic 100 pF ± 5%	DD95101300
CF29			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF30			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF31			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF32			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CF33			Capacitor, Ceramic 120 pF ± 5%	DD95121300
CF34			Capacitor, Ceramic 82 pF ± 5%	DD95820300

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION		PART NUMBER
CF35			Capacitor, Ceramic	10 pF ± 0.5 pF	DD91100300
CF36			Capacitor, Ceramic	39 pF ± 5%	DD95390300
CF37			Capacitor, Ceramic	330 pF ± 5%	DD95331300
CF38			Capacitor, Ceramic	82 pF ± 5%	DD95820300
CF39			Capacitor, Ceramic	36 pF ± 5%	DD95360300
CF40			Capacitor, Ceramic	22 pF ± 5%	DD95220300
CF41			Capacitor, Ceramic	39 pF ± 5%	DD95390300
CF42			Capacitor, Ceramic	12 pF ± 5%	DD95120300
CF43			Capacitor, Ceramic	27 pF ± 5%	DD95270300
CF44			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF45			Capacitor, Ceramic	68 pF ± 5%	DD95680300
CF46			Capacitor, Ceramic	2 pF ± 0.25 pF	DD90020300
CF47			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF48			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF49			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF51			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF52			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF53			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF54			Capacitor, Ceramic	82 pF ± 5%	DD95820300
CF55			Capacitor, Ceramic	3 pF ± 0.25 pF	DD90030300
CF56			Capacitor, Ceramic	36 pF ± 5%	DD95360300
CF57			Capacitor, Ceramic	270 pF ± 5%	DD95271300
CF58			Capacitor, Ceramic	68 pF ± 5%	DD95680300
CF59			Capacitor, Ceramic	39 pF ± 5%	DD95390300
CF60			Capacitor, Ceramic	27 pF ± 5%	DD95270300
CF61			Capacitor, Ceramic	43 pF ± 5%	DD95430300
CF62			Capacitor, Ceramic	2 pF ± 0.25 pF	DD90020300
CF63			Capacitor, Ceramic	12 pF ± 5%	DD95120300
CF64			Capacitor, Ceramic	27 pF ± 5%	DD95270300
CF65			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF66			Capacitor, Ceramic	68 pF ± 5%	DD95680300
CF67			Capacitor, Ceramic	2 pF ± 0.25 pF	DD90020300
CF68			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF69			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF70			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF71			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF72			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF73			Capacitor, Ceramic	120 pF ± 5%	DD95121300
CF74			Capacitor, Ceramic	82 pF ± 5%	DD95820300
CF75			Capacitor, Ceramic	10 pF ± 0.5 pF	DD91100300
CF76			Capacitor, Ceramic	39 pF ± 5%	DD95390300
CF77			Capacitor, Ceramic	330 pF ± 5%	DD95331300
CF78			Capacitor, Ceramic	82 pF ± 5%	DD95820300
CF79			Capacitor, Ceramic	36 pF ± 5%	DD95360300
CF80			Capacitor, Ceramic	22 pF ± 5%	DD95220300
CF81			Capacitor, Ceramic	39 pF ± 5%	DD95390300
CF82			Capacitor, Ceramic	12 pF ± 5%	DD95120300
CF83			Capacitor, Ceramic	27 pF ± 5%	DD95270300
CF84			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF85			Capacitor, Ceramic	68 pF ± 5%	DD95680300
CF86			Capacitor, Ceramic	2 pF ± 0.25 pF	DD90020300
CF87			Capacitor, Ceramic	100 pF ± 5%	DD95101300
CF88			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF89			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF91			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF92			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF93			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CF94			Capacitor, Ceramic	0.01 µF ± 10%	DK96103200
CG01			Capacitor, Ceramic	0.1 µF	DK98104200
CG02			Capacitor, Ceramic	0.1 µF	DK98104200
CG03			Capacitor, Ceramic	0.1 µF	DK98104200

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
CG04			Capacitor, Ceramic 0.1 µF	DK98104200
CG05			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CG06			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CH01			Capacitor, Ceramic 12 pF ± 5%	DD95120300
CH02			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH04			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CH05			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH06			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH07			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CH08			Capacitor, Ceramic 10 pF ± 0.5 pF	DD91100300
CH11			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH12			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH13			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CH14			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH15			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CH16			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH17			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH18			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH21			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH22			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH23			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
CH24			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH25			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CH26			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH27			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH28			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH31			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH32			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH33			Capacitor, Ceramic 3 pF ± 0.25 pF	DD90030300
CH34			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH35			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CH36			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH37			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH38			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH41			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH42			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH43			Capacitor, Ceramic 1 pF ± 0.25 pF	DD90010300
CH44			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CH45			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CH46			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH47			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH48			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH51			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH52			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH53			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH54			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH55			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH56			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH57			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH58			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH59			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH60			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH61			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH62			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH81			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH82			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH83			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH84			Capacitor, Tantalum Chip 47 µF 16 V	EY47601620
CH85			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH86			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CH87			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH88			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CH89			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CJ01			Capacitor, Ceramic 0.1 µF	DK98104200
CJ02			Capacitor, Ceramic 0.1 µF	DK98104200
CJ03			Capacitor, Ceramic 0.1 µF	DK98104200
CJ04			Capacitor, Ceramic 0.1 µF	DK98104200
CJ05			Capacitor, Ceramic 0.1 µF	DK98104200
CJ06			Capacitor, Ceramic 0.1 µF	DK98104200
CJ07			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CJ08			Capacitor, Ceramic 0.1 µF	DK98104200
CJ09			Capacitor, Ceramic 0.1 µF	DK98104200
CJ10			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CJ11			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CJ12			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CK11			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CK12			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CK21			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CK22			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CK31			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CK32			Capacitor, Ceramic 470 pF ± 10%	DK16471300
CL01			Capacitor, Ceramic 33 pF ± 5%	DD95330300
CL02			Capacitor, Ceramic 33 pF ± 5%	DD95330300
CL03			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL04			Capacitor, Ceramic 220 pF ± 10%	DK96221300
CL05			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL06			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CL07			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CL09			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
CL10			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL11			Capacitor, Tantalum Chip 2.2 µF 50 V	EY22505060
CL12			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CL13			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CL14			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CL15			Capacitor, Ceramic 220 pF ± 5%	DD95221300
CL16			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL17			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL18			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL19			Capacitor, Ceramic 1000 pF ± 10%	DK96102300
CL20			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL21			Capacitor, Ceramic 0.1 µF	DK98104200
CL22			Capacitor, Ceramic 0.1 µF	DK98104200
CL23			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CL24			Capacitor, Mica 0.1 µF ± 5%	DF95104060
CM02			Capacitor, Ceramic 0.1 µF	DK98104200
CM03			Capacitor, Ceramic 5 pF ± 0.25 pF	DD90050300
CM05			Capacitor, Ceramic 0.1 µF	DK98104200
CM06			Capacitor, Ceramic 0.1 µF	DK98104200
CM07			Capacitor, Ceramic 470 pF ± 10%	DK96471300
CM08			Capacitor, Ceramic 100 pF ± 5%	DD95101300
CM09			Capacitor, Ceramic 47 pF ± 5%	DD95470300
CM10			Capacitor, Ceramic 0.1 µF	DK98104200
CM11			Capacitor, Ceramic 0.1 µF	DK98104200
CM13			Capacitor, Ceramic 0.1 µF	DK98104200
CM14			Capacitor, Ceramic 0.1 µF	DK98104200
CR01			Capacitor, Ceramic 1 µF 25V Y5 V	DK48105220
CR02			Capacitor, Ceramic 1 µF 25V Y5 V	DK48105220
CR03			Capacitor, Ceramic 1 µF 25V Y5 V	DK48105220
CR04			Capacitor, Ceramic 1 µF 25 V Y5 V	DK48105220
CR05			Capacitor, Ceramic 1 µF 25 V Y5 V	DK48105220
CR06			Capacitor, Ceramic 1 µF 25 V Y5 V	DK48105220

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CR07			Capacitor, Ceramic 1 µF 25 V Y5 V	DK48105220
CR08			Capacitor, Ceramic 1 µF 25 V Y5 V	DK48105220
CU01			Capacitor, Ceramic 0.1 µF	DK98104200
CU02			Capacitor, Ceramic 33 pF ± 5%	DD95330300
CU03			Capacitor, Ceramic 33 pF ± 5%	DD95330300
CU04			Capacitor, Ceramic 0.1 µF	DK98104200
CU05			Capacitor, Ceramic 0.1 µF	DK98104200
CU06			Capacitor, Ceramic 0.1 µF	DK98104200
CU07			Capacitor, Ceramic 0.1 µF	DK98104200
CU08			Capacitor, Ceramic 0.1 µF	DK98104200
CU09			Capacitor, Tantalum Chip 10 µF 10 V	EY10601070
CU10			Capacitor, Ceramic 0.1 µF	DK98104200
CU11			Capacitor, Electrolytic 470 µF 16 V	EA477016P0
CU12			Capacitor, Ceramic 0.1 µF	DK98104200
CU13			Capacitor, Ceramic 0.1 µF	DK98104200
CU14			Capacitor, Ceramic 0.1 µF	DK98104200
CU17			Capacitor, Ceramic 0.1 µF	DK98104200
CU18			Capacitor, Tantalum Chip 10 µF 10 V	EY10601070
CU20			Capacitor, Ceramic 0.1 µF	DK98104200
CU21			Capacitor, Ceramic 0.1 µF	DK98104200
CU23			Capacitor, Ceramic 0.1 µF	DK98104200
CU24			Capacitor, Ceramic 0.1 µF	DK98104200
CU25			Capacitor, Electrolytic 470 µF 16 V	EA477016P0
CV01			Capacitor, Mica 470 pF ± 5%	DF95471040
CV02			Capacitor, Mica 470 pF ± 5%	DF95471040
CV03			Capacitor, Ceramic 0.1 µF	DK98104200
CV04			Capacitor, Ceramic 0.1 µF	DK98104200
CV05			Capacitor, Ceramic 4 pF ± 0.25 pF	DD90040300
CV06			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CV07			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CV08			Capacitor, Ceramic 0.1 µF	DK98104200
CV09			Capacitor, Ceramic 0.1 µF	DK98104200
CV10			Capacitor, Ceramic 2 pF ± 0.25 pF	DD90020300
CV12			Capacitor, Ceramic 8 pF ± 0.5 pF	DD91080300
CV13			Capacitor, Ceramic 68 pF ± 5%	DD95680300
CV14			Capacitor, Ceramic 0.1 µF	DK98104200
CV15			Capacitor, Ceramic 0.1 µF	DK98104200
CV16			Capacitor, Ceramic 0.1 µF	DK98104200
CV17			Capacitor, Ceramic 0.1 µF	DK98104200
CV18			Capacitor, Ceramic 0.1 µF	DK98104200
CV19			Capacitor, Ceramic 0.1 µF	DK98104200
CV20			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CV21			Capacitor, Tantalum Chip 10 µF 16 V	EY10601660
CV22			Capacitor, Ceramic 0.1 µF	DK98104200
CV23			Capacitor, Ceramic 0.1 µF	DK98104200
CV24			Capacitor, Mica 0.047 µF ± 5%	DF95473060
CV25			Capacitor, Mica 0.022 µF ± 5%	DF95223050
CV26			Capacitor, Ceramic 47 pF ± 5%	DD95470300
CV27			Capacitor, Ceramic 0.1 µF	DK98104200
CV28			Capacitor, Ceramic 0.1 µF	DK98104200
CV30			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
CV31			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
CV32			Capacitor, Ceramic 0.1 µF	DK98104200
CV33			Capacitor, Ceramic 0.1 µF	DK98104200
CV34			Capacitor, Ceramic 0.1 µF	DK98104200
CV35			Capacitor, Ceramic 0.1 µF	DK98104200
CV36			Capacitor, Ceramic 0.1 µF	DK98104200
CV37			Capacitor, Ceramic 0.1 µF	DK98104200
CV43			Capacitor, Ceramic 22 pF ± 5%	DD95220300
CV45			Capacitor, Ceramic 22 pF ± 5%	DD95220300

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
CW01			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW02			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW03			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW04			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW05			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW06			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW11			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW12			Capacitor, Ceramic 1000 pF ± 10%	DK16102300
CW13			Capacitor, Electrolytic 10 µF 50 V	EA10605020
CX01			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX02			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX03			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX04			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX05			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX06			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX07			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX08			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX09			Capacitor, Ceramic 0.01 µF ± 10%	DK96103200
CX10			Capacitor, Electrolytic 1000 µF 35 V	EA10803520
CX40			Capacitor, Ceramic 0.1 µF	DK98104200
CX41			Capacitor, Ceramic 0.1 µF	DK98104200
CX81			Capacitor, Tantalum Chip 100 µF 6.3 V	EY10700660
CY01			Capacitor, Ceramic 0.1 µF	DK98104200
CY02			Capacitor, Ceramic 0.1 µF	DK98104200
CY03			Capacitor, Ceramic 0.1 µF	DK98104200
CY04			Capacitor, Ceramic 0.1 µF	DK98104200
CY05			Capacitor, Ceramic 0.1 µF	DK98104200
CY06			Capacitor, Ceramic 0.1 µF	DK98104200

INDUCTORS

F101			Filter, LC 302MNPR-1930AM (480 M BPF BW 40 M)	FF34806010
F841			Protector Unit ICP-N25 T104	FU10215020
F861			Protector Unit ICP-N25 T104	FU10215020
FC11			Filter, Ceramic SFE10.7MA19	FF11070800
FC12			Filter, Ceramic SFE10.7MA20-A	FF11070640
FC13			Filter, Ceramic SFE10.7MA20-A	FF11070640
FC14			Filter, Ceramic SFE10.7MA10K-A	FF11070820
FC15			Filter, Ceramic SFE10.7MA10K-A	FF11070820
FC41			Filter, Ceramic SFE10.7MA19	FF11070800
FC42			Filter, Ceramic SFE10.7MA8	FF11070610
FC43			Filter, Ceramic SFE10.7MA8	FF11070610
FC44			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC45			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC46			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC47			Filter, Crystal HF-10A50	XV710700Z0
FC71			Filter, Ceramic SFE10.7MA19	FF11070800
FC72			Filter, Ceramic SFE10.7MA8	FF11070610
FC73			Filter, Ceramic SFE10.7MA8	FF11070610
FC74			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC75			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC76			Filter, Ceramic SFE10.7MJK-A	FF11070220
FC77			Filter, Crystal HF-10A50	XV710700Z0
FG01			Filter, EMI DSS306-55B101M100	FM12101020
FH11			Filter, SAW SFB0716	FF40070010
FH21			Filter, SAW SFB0718B	FF40070050
FH31			Filter, SAW SFB0722B	FF40070020
FH41			Filter, SAW SFB0725	FF40070030
FV01			Filter, LC Video LPF 6 MHz	FF30600030
FV02			Filter, LC Video LPF 5.5 MHz	FF30550060
FV03			Filter, LC Video LPF 5 MHz	FF30500040
FV04			Filter, LC Video LPF 4.5 MHz	FF30450110

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
FV05			Filter, EMI DSS306-55B101M100	FM12101020
FV06			Filter, EMI DSS306-55B101M100	FM12101020
FV07			Filter, EMI DSS306-55B101M100	FM12101020
FX01			Protector Unit ICP-N25 T104	FU10215020
L101			Relay ARG-311 RF Relay	LY10120190
L102			Relay ARG-311 RF Relay	LY10120190
L103			Relay ARG-311 RF Relay	LY10120190
L104			Inductance, Chip 330 nH	LU15331010
L105			Coil, Choke 0.33 µH SP0408-R33M	LC13310020
L106			Inductance, Chip 330 nH	LU15331010
L107			Inductance, Chip 1 µH N	LU13102030
L108			Inductance, Chip 330 nH	LU15331010
L109			Inductance, Chip 330 nH	LU15331010
L110			Inductance, Chip 4.7 µH	LU15472010
L201			Inductance, Chip 4.7 µH	LU15472010
L221			Inductance, Chip 4.7 µH	LU15472010
L252			Inductance, Chip 3.3 µH	LU15332010
L253			Inductance, Chip 3.3 µH	LU15332010
L301			Coil, IF Transformer KY-5011	LI50180010
L302			Coil, IF Transformer KY-5011	LI50180010
L303			Coil, IF Transformer MJ-7011	LI50180020
L401			Inductance, Chip 10 nH	LU15100010
L402			Inductance, Chip 0.015 µH	LU15150010
L403			Inductance, Chip 150 nH	LU15151010
L405			Inductance, Chip 1 µH	LU15102010
L406			Inductance, Chip 150 nH	LU15151010
L407			Coil, Air 2.5 T-urn	ML03005060
L408			Inductance, Chip 22 nH	LU15220010
L409			Inductance, Chip 22 nH	LU15220010
L410			Inductance, Chip 150 nH	LU15151010
L411			Inductance, Chip 100 nH	LU15101010
L601			Inductance, Chip 1 µH	LU15102010
L602			Inductance, Chip 1.2 µH	LU15122010
L603			Inductance, Chip 1.5 µH	LU15152010
L604			Inductance, Chip 1 µH	LU15102010
L605			Inductance, Chip 1 µH	LU15102010
L831			Coil, Choke 22 µH RCH895-220K	LC22230060
L841			Coil, Choke 1 mH MCDR1419-102K	LC21050060
L861			Coil, Choke 470 µH MCDR1419-471K	LC24740520
L862			Coil, Choke 47 µH RCH985-470K	LC24730030
LA11			Coil, IF Transformer S IF Det_1 #1	LI70559020
LA12			Coil, IF Transformer S IF Det_2 #1	LI70559030
LA41			Coil, IF Transformer S IF Det_1 #2	LI70559020
LA42			Coil, IF Transformer S IF Det_2 #2	LI70559030
LA71			Coil, IF Transformer S IF Det_1 #3	LI70559020
LA72			Coil, IF Transformer S IF Det_2 #3	LI70559030
LB11			Coil, Oscillator Transformer	LO70446010
LB12			Coil, IF Transformer 10.7 MHz S IF Transformer #1	LI70036450
LB41			Coil, Oscillator Transformer	LO70446010
LB42			Coil, IF Transformer 10.7 MHz S IF Transformer #2	LI70036450
LB71			Coil, Oscillator Transformer	LO70446010
LB72			Coil, IF Transformer 10.7 MHz S IF Transformer #3	LI70036450
LC41			Coil, IF Transformer 880 kHz_1	LI70559040
LC42			Coil, IF Transformer 880 kHz_2	LI70559050
LC43			Coil, IF Transformer 880 kHz_3	LI70559060
LC71			Coil, IF Transformer 880 kHz_1	LI70559040
LC72			Coil, IF Transformer 880 kHz_2	LI70559050
LC73			Coil, IF Transformer 880 kHz_3	LI70559060
LF11			Coil, Choke 0.2 µH 4-Turn	LC12010090
LF12			Coil, Choke 0.15 µH 3-Turn	LC11510120

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
LF13			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF14			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF15			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF16			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF17			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF31			Coil, Choke 0.2 µH 4-Turn	LC12010090
LF32			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF33			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF34			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF35			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF36			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF37			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF51			Coil, Choke 0.2 µH 4-Turn	LC12010090
LF52			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF53			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF54			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF55			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF56			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF57			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF71			Coil, Choke 0.2 µH 4-Turn	LC12010090
LF72			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF73			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF74			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF75			Coil, Choke 0.15 µH 3-Turn	LC11510120
LF76			Coil, Choke 0.1 µH 3-Turn	LC11010120
LF77			Coil, Choke 0.1 µH 3-Turn	LC11010120
LH01			Coil 59.7 µH 4-Turn	LL22411040
LH02			Coil 59.7 µH 4-Turn	LL22411040
LH11			Coil, Choke 0.38 µH	LC13810030
LH12			Inductance, Chip 1 µH	LU15102010
LH21			Coil, Choke 0.38 µH	LC13810030
LH22			Inductance, Chip 1 µH	LU15102010
LH31			Coil, Choke 0.38 µH	LC13810030
LH32			Inductance, Chip 1 µH	LU15102010
LH41			Coil, Choke 0.38 µH	LC13810030
LH42			Inductance, Chip 1 µH	LU15102010
LH81			Inductance, Chip 1 µH	LU15102010
LH82			Inductance, Chip 1 µH	LU15102010
LV01			Inductance, Chip 33 µH	LU15333010
LX01			Coil, Choke 47 µH 1.3 A	LC24730030
LX02			Coil, Choke 47 µH 1.3 A	LC24730030

SEMICONDUCTORS

Q101			IC NJM2082M	HC10103090
Q102			IC UPC2709T	HC10273060
Q201			FET, Chip 3SK131 (V12)	HY401311C0
Q202			IC UPC1688G	HC10251060
Q221			IC UPC1688G	HC10251060
Q222			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q223			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q224			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q251			IC UPC1658G	HC10319060
Q252			Transistor, Chip 2SC3357 (RH,RF)	HX333572A0
Q301			IC MC1658M	HC10097170
Q303			Transistor, Chip 2SC2712	HX327121A0
Q304			Transistor, Chip 2SA1162	HX111621A0
Q305			Transistor, Chip 2SC2712	HX327121A0
Q306			IC AD811AR	HC10003840
Q351			IC RH5RE50AA	HC91B50770
Q401			IC UPC1687G	HC10274060
Q402			Transistor, Chip 2SC2714 (Y)	HX327141C0

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
Q403			Transistor, Chip 2SC4094 (R37)	HX340941B0
Q501			IC TD6134AF (EL)	HC10450050
Q502			IC 74HCU04AF	HC700400Z0
Q521			IC NJM2082M	HC10103090
Q522			IC NJM4558M	HC10011090
Q551			IC NJM4558M	HC10011090
Q571			IC NJM4558M	HC10011090
Q601			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q602			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q603			Transistor, Chip 2SC2351 (R3)	HX323511B0
Q651			IC NJM2082M	HC10103090
Q652			IC NJM2082M	HC10103090
Q653			IC NJM2082M	HC10103090
Q654			Semiconductor, Composite UMX1	BA20061210
Q711			IC NJM5532M	HC10034090
Q712			IC NJM4556AM	HC10045090
Q741			IC NJM5532M	HC10034090
Q742			IC NJM4556AM	HC10045090
Q771			IC NJM5532M	HC10034090
Q772			IC NJM4556AM	HC10045090
Q811			IC NJM78M15FA	HC3851509F
Q812			IC NJM79M15FA	HC3951509F
Q813			IC NJM78M12FA	HC3851209F
Q821			IC NJM7805FA	HC3890509F
Q822			IC NJM79M05FA	HC3950509F
Q841			IC PQ1CG1	HC10054320
Q842			IC 74HC00	HC700000D0
Q843			Transistor 2SB1186 –120 V -1.5 A	HT211862A0
Q844			Semiconductor, Composite DTC114ES	BA20001000
Q845			Semiconductor, Composite DTC114ES	BA20001000
Q846			Semiconductor, Composite DTC114ES	BA20001000
Q847			Transistor 2SA933S (R or S)	HT109332B0
Q861			IC PQ1CG1	HC10054320
Q901			IC NE572D,SA572D	HC10051270
Q902			IC NE5517D	HC10052270
Q903			IC NJM2082M	HC10103090
Q941			Transistor, Chip 2SA1162 0,Y	HX111622A0
Q942			Transistor, Chip 2SC2712 0,Y	HX327122A0
Q971			Transistor, Chip 2SA1162 0,Y	HX111622A0
Q972			Transistor, Chip 2SC2712 0,Y	HX327122A0
QA11			IC LA1235 SIF Detector #1	HC10191030
QA12			Transistor, Chip 2SA1162 0,Y	HX111622A0
QA13			Transistor, Chip 2SA1162 0,Y	HX111622A0
QA41			IC LA1235 S IF Detector #2	HC10191030
QA42			Transistor, Chip 2SA1162 0,Y	HX111622A0
QA43			Transistor, Chip 2SA1162 0,Y	HX111622A0
QA71			IC LA1235 S IF Detector #3	HC10191030
QA72			Transistor, Chip 2SA1162 0,Y	HX111622A0
QA73			Transistor, Chip 2SA1162 0,Y	HX111622A0
QB11			IC NJM2203D S IF Converter #1	HC10041090
QB12			IC MC145157DW2 #1 S IF PLL	HC10106170
QB13			IC NJM4458M	HC10011090
QB41			IC NJM2203D S IF Converter #2	HC10041090
QB42			IC MC145157DW2 #2 S IF PLL	HC10106170
QB43			IC NJM4458M	HC10011090
QB71			IC NJM2203D S IF Converter #3	HC10041090
QB72			IC MC145157DW2 #3 SIF PLL	HC10106170
QB73			IC NJM4458M	HC10011090
QD01			IC DS1267S-010 #2,3 E-POT	HC10078990
QD11			IC NJM2082M	HC10103090

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
QD12			Transistor, Chip 2SC3326	HX333262A0
QD13			Transistor, Chip 2SC3326	HX333262A0
QD14			Transistor, Chip 2SC3326	HX333262A0
QD15			Semiconductor, Composite DTA114EU	BA10026210
QD16			Semiconductor, Composite DTA114EU	BA10026210
QD17			Semiconductor, Composite DTA114EU	BA10026210
QD31			IC DS1267S-010 #1 E-POT	HC10078990
QD41			IC NJM2082M	HC10103090
QD42			Transistor, Chip 2SC3326	HX333262A0
QD43			Transistor, Chip 2SC3326	HX333262A0
QD44			Transistor, Chip 2SC3326	HX333262A0
QD45			Semiconductor, Composite DTA114EU	BA10026210
QD46			Semiconductor, Composite DTA114EU	BA10026210
QD47			Semiconductor, Composite DTA114EU	BA10026210
QD71			IC NJM2082M	HC10103090
QD72			Transistor, Chip 2SC3326	HX333262A0
QD73			Transistor, Chip 2SC3326	HX333262A0
QD74			Transistor, Chip 2SC3326	HX333262A0
QD75			Semiconductor, Composite DTA114EU	BA10026210
QD76			Semiconductor, Composite DTA114EU	BA10026210
QD77			Semiconductor, Composite DTA114EU	BA10026210
QE01			IC NJM2082M	HC10103090
QE41			FET, Chip 2SK209 (BL)	HY202091D0
QE42			FET, Chip 2SK209 (BL)	HY202091D0
QE43			Transistor, Chip 2SC3326	HX333262A0
QE44			Transistor, Chip 2SC3326	HX333262A0
QE45			Semiconductor, Composite DTA114EU	BA10026210
QE46			Semiconductor, Composite DTA114EU	BA10026210
QE47			Semiconductor, Composite DTA114EU	BA10026210
QE48			Semiconductor, Composite DTA114EU	BA10026210
QE71			FET, Chip 2SK209 (BL)	HY202091D0
QE72			FET, Chip 2SK209 (BL)	HY202091D0
QE73			Transistor, Chip 2SC3326	HX333262A0
QE74			Transistor, Chip 2SC3326	HX333262A0
QE75			Semiconductor, Composite DTA114EU	BA10026210
QE76			Semiconductor, Composite DTA114EU	BA10026210
QE77			Semiconductor, Composite DTA114EU	BA10026210
QE78			Semiconductor, Composite DTA114EU	BA10026210
QG01			IC MAX4121CSA	HC10081990
QG02			IC CLC522AJE	HC10042360
QH01			IC UPC1688G	HC10251060
QH11			IC UPC1688G	HC10251060
QH21			IC UPC1688G	HC10251060
QH31			IC UPC1688G	HC10251060
QH41			IC UPC1688G	HC10251060
QJ01			IC DS1267S-010	HC10078990
QJ02			IC NJM4558M	HC10011090
QJ03			IC LM4041DIM3-1.2	HC10038360
QL01			IC MB1501 2ND PLL	HC10052180
QL02			IC NJM062MD	HC10054090
QL03			Transistor, Chip 2SA1586 (GR)	HX115861B0
QM01			Transistor, Chip 2SA1162 0,Y	HX111622A0
QM02			Transistor, Chip 2SC2712 0,Y	HX327122A0
QM03			Transistor, Chip 2SC2712 0,Y	HX327122A0
QM04			Semiconductor, Composite DTA114EU	BA10026210
QM05			Semiconductor, Composite DTA114EU	BA10026210
QM06			Semiconductor, Composite DTC114EU	BA20035210
QM07			Semiconductor, Composite DTC114EU	BA20035210
QM08			Transistor, Chip 2SC2712 0,Y	HX327122A0
QM09			IC LM1881M	HC10021360
QM10			IC 74HC4053	HC705300Z0

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
QR01			IC SED1526F0A	HC1009053F
QU01			IC MAX705CSA	HC10080990
QU02			IC S80552C-CA68	HC10181490
QU03			IC 74HC374AF	HC737405Z0
QU04			EPROM/EEPROM Flash ROM	HJ443BX10F
QU05			IC CY7C199VCT S-RAM 256K	HC10079990
QU06			IC 74HC00	HC700000Z0
QU07			IC TC74HC157A	HC715705Z0
QU08			IC XCS05-3VQ100C	HC1007599F
QU09			IC DS1302Z	HC10077990
QU10			IC AT24C256-10PC	HC10076990
QU11			IC DS1267S-010	HC10078990
QU12			IC NJM4558M	HC10011090
QU13			Semiconductor, Composite DTA114EU	BA10026210
QU14			Semiconductor, Composite DTA114EU	BA10026210
QU15			Semiconductor, Composite DTA114EU	BA10026210
QU16			Semiconductor, Composite DTA114EU	BA10026210
QU17			Semiconductor, Composite DTA114EU	BA10026210
QU18			Semiconductor, Composite DTA114EU	BA10026210
QU19			Semiconductor, Composite DTA114EU	BA10026210
QU20			Semiconductor, Composite DTA114EU	BA10026210
QU21			Semiconductor, Composite DTA114EU	BA10026210
QU22			Semiconductor, Composite DTA114EU	BA10026210
QU23			Semiconductor, Composite DTA114EU	BA10026210
QV01			IC MAX4121CSA	HC10081990
QV02			IC HA9P5020-5	HC10049990
QV03			IC MAX4121CSA	HC10081990
QV04			IC MAX4121CSA	HC10081990
QV05			IC MAX4121CSA	HC10081990
QV06			IC LC522AJE	HC10042360
QV07			FET, Chip 2SK209 (BL)	HY202091D0
QV08			FET, Chip 2SK209 (BL)	HY202091D0
QV09			FET, Chip 2SK209 (BL)	HY202091D0
QV10			IC HA9P5020-5	HC10049990
QV11			IC HA9P5020-5	HC10049990
QV12			IC HA9P5020-5	HC10049990
QW01			Semiconductor, Composite DTC114ESA	BA20001000
QW02			Semiconductor, Composite DTC114ESA	BA20001000
QX01			IC XCS05-3VQ100C	HC1007599F
QX21			Transistor, Chip 2SA1162 0,Y	HX111622A0
QX22			Semiconductor, Composite DTC114EU	BA20035210
QX23			Transistor, Chip 2SA1162 0,Y	HX111622A0
QX24			Semiconductor, Composite DTC114EU	BA20035210
QX25			Transistor, Chip 2SA1162 0,Y	HX111622A0
QX26			Semiconductor, Composite DTC114EU	BA20035210
QX41			Semiconductor, Composite DTC114EU	BA20035210
QX42			Semiconductor, Composite DTC114EU	BA20035210
QX43			Semiconductor, Composite DTC114EU	BA20035210
QX44			Semiconductor, Composite DTC114EU	BA20035210
QX45			Semiconductor, Composite DTC114EU	BA20035210
QX46			Semiconductor, Composite DTC114EU	BA20035210
QX47			Semiconductor, Composite DTC114EU	BA20035210
QX48			Semiconductor, Composite DTC114EU	BA20035210
QX49			Semiconductor, Composite DTC114EU	BA20035210
QX50			Semiconductor, Composite DTC114EU	BA20035210
QX51			Semiconductor, Composite DTC114EU	BA20035210
QX52			Semiconductor, Composite DTC114EU	BA20035210
QX53			Semiconductor, Composite DTC114EU	BA20035210
QY01			IC MAX3221ECAE	HC10083990
QY02			IC MAX491ECSD	HC10082990

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
QY11			Transistor, Chip 2SC2712 0,Y	HX327122A0
QY12			Transistor, Chip 2SA1162 0,Y	HX111622A0
QY13			Transistor, Chip 2SA1162 0,Y	HX111622A0
QY14			Transistor, Chip 2SA1162 0,Y	HX111622A0
QY15			Transistor, Chip 2SA1162 0,Y	HX111622A0
QY16			Transistor, Chip 2SC2712 0,Y	HX327122A0
QY17			Transistor, Chip 2SC2712 0,Y	HX327122A0
QY18			Transistor, Chip 2SC2712 0,Y	HX327122A0
QY19			Transistor, Chip 2SC2712 0,Y	HX327122A0

RESISTORS

R101			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R102			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R103			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R104			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R105			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R106			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R107			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R108			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
R109			Resistor, Trimming 10 k Ohm	NY01030160
R110			Resistor, Chip 2.7 k Ohm ± 5% 1/16 W	NN05272610
R111			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
R113			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R114			Resistor, Chip 47 Ohm ± 5% 1/16 W w	NN05470610
R115			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R117			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
R140			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
R141			Resistor, Chip 18 Ohm ± 5% 1/16 W	NN05180610
R142			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
R151			Resistor 2.2 M Ohm ± 10% 92 W	RC10225920
R152			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R153			Resistor, Chip 27 Ohm ± 5% 1/16 W	NN05270610
R154			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R201			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R202			Resistor, Chip 22 Ohm ± 5% 1/16 W	NN05220610
R203			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R204			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R205			Resistor, Chip 12 k Ohm ± 5% 1/16 W	NN05123610
R206			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R207			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R208			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
R209			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R210			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R211			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
R212			Resistor, Chip 47 Ohm ± 5% 1/16 W	NN05470610
R213			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
R221			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
R222			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R223			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
R224			Resistor, Chip 1.2 k Ohm ± 5% 1/16 W	NN05122610
R225			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R226			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R227			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R228			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R229			Resistor, Chip 1.5 k Ohm ± 5% 1/16 W	NN05152610
R230			Resistor, Chip 1.5 k Ohm ± 5% 1/16 W	NN05152610
R231			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R232			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R233			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R234			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R235			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
R236			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
R237			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
R238			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R239			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R240			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R241			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R242			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R251			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
R252			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R253			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
R254			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
R255			Resistor, Trimming 3 k Ohm	NY03020160
R256			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R257			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
R258			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R259			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R260			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R261			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R262			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
R263			Resistor, Chip 18 Ohm ± 5% 1/16 W	NN05180610
R264			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
R301			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R302			Resistor, Chip 47 Ohm ± 5% 1/16 W	NN05470610
R303			Resistor, Chip 47 Ohm ± 5% 1/16 W	NN05470610
R304			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R305			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R306			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
R307			Resistor, Trimming 500 Ohm	NY05010160
R308			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R309			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
R310			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R311			Resistor, Trimming 10 k Ohm	NY01030160
R312			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R313			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R314			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R315			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R316			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R317			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R318			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R319			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R320			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R321			Resistor, Chip 39 Ohm ± 5% 1/16 W	NN05390610
R322			Resistor, Chip 820 Ohm ± 5% 1/16 W	NN05821610
R323			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R324			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R325			Resistor, Chip 47 Ohm ± 5% 1/16 W	NN05470610
R326			Resistor, Trimming 100 Ohm	NY01010160
R327			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R328			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R329			Resistor, Trimming 10 k Ohm	NY01030160
R330			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R331			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
R351			Resistor 56 Ohm ± 5% 1 W	GA05560010
R401			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R402			Resistor, Chip 39 Ohm ± 5% 1/16 W	NN05390610
R403			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R404			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R405			Resistor, Chip 22 Ohm ± 5% 1/16 W	NN05220610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R406			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R407			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R408			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R409			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R410			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R411			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R412			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R413			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R414			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
R415			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R416			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R417			Resistor, Chip 820 Ohm ± 5% 1/16 W	NN05821610
R418			Resistor, Chip 27 Ohm ± 5% 1/16 W	NN05270610
R419			Resistor, Chip 820 Ohm ± 5% 1/16 W	NN05821610
R420			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
R421			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R422			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
R423			Resistor, Chip 820 Ohm ± 5% 1/16 W	NN05821610
R424			Resistor, Chip 820 Ohm ± 5% 1/16 W	NN05821610
R425			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R426			Resistor, Chip 22 Ohm ± 5% 1/16 W	NN05220610
R427			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R428			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R501			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R502			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R503			Resistor, Chip 56 k Ohm ± 5% 1/16 W	NN05563610
R504			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R521			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
R522			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R523			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R524			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R525			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R526			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
R527			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
R528			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R529			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
R531			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R532			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R533			Resistor, Trimming 10 k Ohm	NY01030160
R534			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
R535			Resistor, Chip 2.2 M Ohm ± 5% 1/16 W	NN05225610
R536			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R551			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
R552			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R553			Resistor, Trimming 10 k Ohm	NY01030160
R554			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R555			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R556			Resistor, Trimming 50 k Ohm	NY05030160
R557			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R558			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R559			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R560			Resistor, Chip 82 k Ohm ± 5% 1/16 W	NN05823610
R561			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R562			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R571			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R572			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R573			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R574			Resistor, Trimming 10 k Ohm	NY01030160
R575			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R576			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R577			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R581			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
R582			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R583			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
R584			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R585			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
R586			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R587			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R591			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
R592			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R593			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R594			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R595			Resistor, Chip 82 k Ohm ± 5% 1/16 W	NN05823610
R596			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R597			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
R601			Resistor, Chip 10 Ohm ± 5% 1/16 W	NN05100610
R602			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R603			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R604			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R606			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
R607			Resistor, Trimming 200 Ohm	NY02010160
R608			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
R609			Resistor, Chip 4.7 Ohm ± 5% 1/16 W	NN05047610
R610			Resistor, Chip 18 Ohm ± 5% 1/16 W	NN05180610
R611			Resistor, Chip 3.3 Ohm ± 5% 1/16 W	NN05033610
R612			Resistor, Chip 1 Ohm ± 5% 1/16 W	NN05010610
R613			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
R614			Resistor, Chip 27 Ohm ± 5% 1/16 W	NN05270610
R615			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R616			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R617			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R618			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R619			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R620			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R621			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R622			Resistor, Chip 12 k Ohm ± 5% 1/16 W	NN05123610
R623			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R624			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R625			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R626			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
R627			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R628			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
R629			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R630			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R631			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R651			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R652			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R653			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R654			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
R655			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
R656			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R657			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R658			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R659			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R660			Resistor, Chip 56 k Ohm ± 5% 1/16 W	NN05563610
R661			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
R662			Resistor, Kanon 1 k Ohm ±5% 1/6 W +3300 ppm / °C	NB51024330
R663			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R665			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R666			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
R667			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R668			Resistor, Trimming 50 k Ohm	NY05030160
R669			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R670			Resistor, Chip 5.6 k Ohm ± 5% 1/16 W	NN05562610
R671			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R711			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R712			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R713			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R714			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R715			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R716			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R717			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R718			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R719			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R720			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R721			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R722			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R723			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R724			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R725			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R726			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R727			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R728			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R741			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R742			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R743			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R744			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R745			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R746			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R747			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R748			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R749			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R750			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R751			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R752			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R753			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R754			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R755			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R756			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R757			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R758			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R771			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R772			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R773			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R774			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R775			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R776			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
R777			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R778			Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
R779			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R780			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
R781			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R782			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R783			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R784			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R785			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R786			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R787			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R788			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
R801			Resistor 10 Ohm ± 5% 1/6 W	GG05100160
R802			Resistor, Metal 2.2 k Ohm ± 5% 2 W	NK05222020
R841			Resistor, Chip 1 k Ohm ± 1% 1/6 W	GM11610010
R842			Resistor 10 k Ohm ± 1% 1/6 W	GM11610020
R843			Resistor 3.01 k Ohm ± 1% 1/6 W	GM11630110
R844			Resistor, Chip 1 Ohm ± 5% 1 W	GA05010010
R845			Resistor 1 k Ohm ± 5% 1 W	GA05102010
R846			Resistor 10 k Ohm ± 5% 1/6 W	GD05103160
R848			Resistor 6.8 k Ohm ± 5% 1/6 W	GD05682160
R849			Resistor 1 k Ohm ± 5% 1/6 W	GD05102160
R850			Resistor 39 k Ohm ± 5% 1/6 W	GD05393160
R851			Resistor 39 k Ohm ± 5% 1/6 W	GD05393160
R853			Resistor 1 k Ohm ± 5% 1/6 W	GD05102160
R854			Resistor 10 k Ohm ± 5% 1/6 W	GD05103160
R855			Resistor 2.7 k Ohm ± 5% 1/6 W	GD05272160
R856			Resistor 680 Ohm ± 5% 1 W	GA05681010
R861			Resistor, Chip 1 k Ohm ± 1% 1/6 W	GM11610010
R862			Resistor 3.01 k Ohm ± 1% 1/6 W	GM11630110
R863			Resistor 100 Ohm ± 5% 1 W	GA05101010
R901			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R902			Resistor, Chip 3.9 k Ohm ± 5% 1/16 W	NN05392610
R903			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
R904			Resistor 22 Ohm ± 5% 1/6 W	GG05220160
R904		U020001→	Resistor 1 Ohm ± 5% 1/6 W	GG05010160
R941			Resistor, Trimming 1 k Ohm	NY01020160
R942			Resistor, Trimming 10 k Ohm	NY01030160
R943			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R944			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R945			Resistor, Chip 1.8 M Ohm ± 5% 1/10 W	NI05185110
R946			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
R947			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R948			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R949			Resistor, Chip 5.6 k Ohm ± 5% 1/16 W	NN05562610
R950			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R951			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R952			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R953			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R954			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R955			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R956			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R957			Resistor, Chip 56 k Ohm ± 5% 1/16 W	NN05563610
R958			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R959			Resistor, Chip 5.6 k Ohm ± 5% 1/16 W	NN05562610
R960			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R961			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R962			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R963			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R964			Resistor, Trimming 5 k Ohm	NY05020160
R971			Resistor, Trimming 1 k Ohm	NY01020160
R972			Resistor, Trimming 10 k Ohm	NY01030160
R973			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
R974			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R975			Resistor, Chip 1.8 M Ohm ± 5% 1/10 W	NI05185110
R976			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
R977			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R978			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
R979			Resistor, Chip 5.6 k Ohm ± 5% 1/16 W	NN05562610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
R980			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R981			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R982			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
R983			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R984			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R985			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
R986			Resistor, Chip 33 k Ohm ± 5% 1/16 W	NN05333610
R987			Resistor, Chip 56 k Ohm ± 5% 1/16 W	NN05563610
R988			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
R989			Resistor, Chip 5.6 k Ohm ± 5% 1/16 W	NN05562610
R990			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R991			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R992			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
R993			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
R994			Resistor, Trimming 5 k Ohm	NY05020160
RA11			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA12			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA13			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA14			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA15			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA16			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA17			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA18			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA19			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RA20			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA21			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA22			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
RA23			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA24			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA25			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA26			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA27			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA28			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RA41			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA42			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA43			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA44			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA45			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA46			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA47			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA48			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA49			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RA50			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA51			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA52			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
RA53			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA54			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA55			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA56			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA57			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA58			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RA71			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA72			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA73			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA74			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RA75			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA76			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA77			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RA78			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RA79			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RA80			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RA81			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA82			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
RA83			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA84			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA85			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RA86			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RA87			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RA88			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RB01			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RB02			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB11			Resistor, Chip 3.9 k Ohm ± 5% 1/16 W	NN05392610
RB12			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB13			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RB14			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB15			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RB16			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RB17			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB19			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB20			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB21			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB22			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB23			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB24			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RB25			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB26			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB27			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB28			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RB29			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB41			Resistor, Chip 3.9 k Ohm ± 5% 1/16 W	NN05392610
RB42			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB43			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RB44			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB45			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RB46			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RB47			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB49			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB50			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB51			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RB52			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB53			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB54			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RB55			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB56			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB57			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB58			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RB59			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RB71			Resistor, Chip 3.9 k Ohm ± 5% 1/16 W	NN05392610
RB72			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB73			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RB74			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB75			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RB76			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RB77			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB79			Resistor, Chip 22 k Ohm ± 5%	NN05223610
RB80			Resistor, Chip 22 k Ohm ± 5%	NN05223610
RB81			Resistor, Chip 22 k Ohm ± 5%	NN05223610
RB82			Resistor, Chip 6.8 k Ohm ± 5%	NN05682610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RB83			Resistor, Chip 6.8 k Ohm ± 5%	NN05682610
RB84			Resistor 47 Ohm ± 5% 1/6 W	GG05470160
RB85			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB86			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB87			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RB88			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RB89			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RC11			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC12			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC13			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC14			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC15			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC16			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC17			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC18			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC19			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC20			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC41			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC42			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC43			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC44			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC45			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC46			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC47			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC48			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC49			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC50			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC51			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC52			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC53			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC54			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC71			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC72			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC73			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC74			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC75			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC76			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC77			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC78			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC79			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RC80			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC81			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC82			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC83			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RC84			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RD01			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD02			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD03			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD04			Resistor 22 Ohm ± 5% 1/6 W	GG05220160
RD05			Resistor 22 Ohm ± 5% 1/6 W	GG05220160
RD11			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RD12			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RD13			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RD14			Resistor, Chip 270 k Ohm ± 5% 1/16 W	NN05274610
RD15			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD16			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD17			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD18			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD19			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RD20			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD21			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD22			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD23			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD24			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD25			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD26			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD31			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD32			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD33			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD41			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD42			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RD43			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RD44			Resistor, Chip 270 k Ohm ± 5% 1/16 W	NN05274610
RD45			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD46			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD47			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD48			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD49			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD50			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD51			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD52			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD53			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD54			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD55			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD56			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD71			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD72			Resistor, Chip 39 k Ohm ± 5% 1/16 W	NN05393610
RD73			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RD74			Resistor, Chip 270 k Ohm ± 5% 1/16 W	NN05274610
RD75			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD76			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD77			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RD78			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD79			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD80			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RD81			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD82			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD83			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RD84			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD85			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RD86			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RE11			Resistor, Trimming 20 k Ohm	NY02030160
RE12			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE41			Resistor, Trimming 20 k Ohm	NY02030160
RE42			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE43			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
RE44			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RE45			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
RE46			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RE47			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RE48			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RE49			Resistor, Chip 12 k Ohm ± 5% 1/16 W	NN05123610
RE50			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RE51			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RE52			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RE53			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE54			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE55			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RE56			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RE71			Resistor, Trimming 20 k Ohm	NY02030160
RE72			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE73			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
RE74			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RE75			Resistor, Chip 1.8 k Ohm ± 5% 1/16 W	NN05182610
RE76			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RE77			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RE78			Resistor, Chip 22 k Ohm ± 5% 1/16 W	NN05223610
RE79			Resistor, Chip 12 k Ohm ± 5% 1/16 W	NN05123610
RE80			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RE81			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RE82			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RE83			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE84			Resistor, Chip 47 k Ohm ± 5% 1/16 W	NN05473610
RE85			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RE86			Resistor, Chip 470 k Ohm ± 5% 1/16 W	NN05474610
RF11			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF12			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF13			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
RF14			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF15			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF16			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RF17			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF18			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF31			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF32			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF33			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
RF34			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF35			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF36			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RF37			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF38			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF51			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF52			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF53			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
RF54			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF55			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF56			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RF57			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF58			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF71			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RF72			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF73			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
RF74			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RF75			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF76			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RF77			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RF78			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RG01			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RG02			Resistor, Trimming 100 Ohm	NY01010160
RG03			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
RG04			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RG05			Resistor, Trimming 200 Ohm	NY02010160
RG06			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RG07			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RG08			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RG09			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RG11			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RG12			Resistor, Chip 1.5 k Ohm ± 5% 1/16 W	NN05152610
RG13			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RG14			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RH01			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RH05			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RH11			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH12			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RH13			Resistor, Chip 82 Ohm ± 5% 1/16 W	NN05820610
RH14			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RH15			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RH16			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH21			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH22			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RH23			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RH24			Resistor, Chip 47 Ohm ± 5% 1/16 W	NN05470610
RH25			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RH26			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH31			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH32			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RH33			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RH34			Resistor, Chip 15 Ohm ± 5% 1/16 W	NN05150610
RH35			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RH36			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH41			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH42			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
RH43			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RH44			Resistor, Chip 56 Ohm ± 5% 1/16 W	NN05560610
RH45			Resistor, Chip 120 Ohm ± 5% 1/16 W	NN05121610
RH46			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH81			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RH83			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RJ01			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RJ02			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RJ03			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RJ04			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RJ05			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RJ06			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RJ07			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RJ08			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RJ09			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RJ10			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RJ11			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RJ12			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RJ13			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RJ14			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RK11			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RK12			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RK21			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RK22			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RK31			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RK32			Resistor 47 Ohm ± 5% 1/6 W	GD05470160
RL01			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610
RL02			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
RL03			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
RL04			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RL05			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RL06			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RL07			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RL08			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RL09			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RL10			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RL11			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RL12			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
RL13			Resistor, Chip 3.3 M Ohm ± 5% 1/16 W	NN05335610
RL14			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RL15			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RM01			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RM02			Resistor, Trimming 500 Ohm	NY05010160
RM03			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RM04			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RM05			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RM06			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RM07			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
RM08			Resistor, Chip 2.2 M Ohm ± 5% 1/16 W	NN05225610
RM09			Resistor, Chip 1 M Ohm ± 5% 1/16 W	NN05105610
RM10			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RM12			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RM13			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RM14			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RM15			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RM16			Resistor, Chip 2.2 k Ohm ± 5% 1/16 W	NN05222610
RM17			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RM18			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RM19			Resistor, Chip 680 k Ohm ± 5% 1/16 W	NN05684610
RR01			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR02			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR03			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR04			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR05			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR06			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR07			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR08			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR09			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR10			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR11			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR12			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR13			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR14			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR15			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR16			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR17			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR18			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR19			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR20			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR21			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR22			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR23			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR24			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR25			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR26			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR27			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR28			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR29			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR30			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR31			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR32			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR33			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610
RR34			Resistor, Chip 75 Ohm ± 5% 1/16 W	NP05750610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RR35			Resistor, Chip 3.9 M Ohm ± 5% 1/16 W	NN05395610
RR36			Resistor, Chip 3.9 M Ohm ± 5% 1/16 W	NN05395610
RR37			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
RR37		U020001→	Resistor, Chip 150 k Ohm ± 5% 1/16 W	NN05154610
RR38			Resistor, Chip 1 M Ohm ± 5% 1/16 W	NN05105610
RR39			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR40			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR41			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR42			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR43			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR44			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR45			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR46			Resistor, Chip 180 Ohm ± 5% 1/16 W	NN05181610
RR47			Resistor, Variable 10 k Ohm ± 10%	RK01031570
RR48			Resistor, Variable 10 k Ohm ± 10%	RK01031560
RU01			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RU02			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU03			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU04			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU05			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU06			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU07			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU08			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU09			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU10			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU11			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU12			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU13			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU14			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU15			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU16			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU17			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU18			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU19			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU20			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU21			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU22			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU23			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU24			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RU25			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU26			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU35			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU36			Resistor, Chip 100 Ohm ± 5% 1/4 W	RI05101140
RU37			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RU38			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU39			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RU40			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RU41			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RU42			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RU43			Resistor, Chip 6.2 k Ohm ± 5% 1/10 W	NI05622110
RU44			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU45			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU46			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU51			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU52			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU53			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU54			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU55			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RU56			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RU57			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RU58			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RV01			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV02			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV03			Resistor, Trimming 500 Ohm	NY05010160
RV04			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
RV05			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RV06			Resistor, Trimming 100 Ohm	NY01010160
RV07			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV08			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV09			Resistor, Trimming 500 Ohm	NY05010160
RV10			Resistor, Chip 220 Ohm ± 5% 1/16 W	NN05221610
RV11			Resistor, Chip 150 Ohm ± 5% 1/16 W	NN05151610
RV12			Resistor, Trimming 100 Ohm	NY01010160
RV13			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV14			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RV16			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RV17			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV18			Resistor, Trimming 500 Ohm	NY05010160
RV19			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV20			Resistor, Trimming 10 k Ohm	NY01030160
RV22			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV23			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RV24			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV27			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV29			Resistor, Chip 4.7 k Ohm ± 5% 1/16 W	NN05472610
RV30			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV32			Resistor, Chip 15 k Ohm ± 5% 1/16 W	NN05153610
RV33			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV36			Resistor, Chip 0 Ohm ± 5% 1/16 W	NN05000610
RV37			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV38			Resistor, Chip 3.9 k Ohm ± 5% 1/16 W	NN05392610
RV39			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RV41			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV42			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
RV43			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
RV46			Resistor, Chip 330 Ohm ± 5% 1/16 W	NN05331610
RV47			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
RV49			Resistor, Chip 12 k Ohm ± 5% 1/16 W	NN05123610
RV50			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RV51			Resistor, Chip 390 Ohm ± 5% 1/16 W	NN05391610
RV52			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
RV54			Resistor, Chip 8.2 k Ohm ± 5% 1/16 W	NN05822610
RV56			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV57			Resistor, Chip 680 Ohm ± 5% 1/16 W	NN05681610
RV58			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV59			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV60			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV61			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV62			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RV63			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV64			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RV65			Resistor, Chip 270 Ohm ± 5% 1/16 W	NN05271610
RV66			Resistor, Chip 1.5 k Ohm ± 5% 1/16 W	NN05152610
RV67			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RV68			Resistor, Chip 100 Ohm ± 5% 1/16 W	NN05101610
RV69			Resistor, Chip 1 M Ohm ± 5% 1/16 W	NN05105610
RV73			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RV74			Resistor, Chip 68 Ohm ± 5% 1/16 W	NN05680610

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
RV75			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV76			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV77			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV81			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV82			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV83			Resistor, Chip 75 Ohm ± 1% 1/16 W	NM1750G020
RV85			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RV86			Resistor, Chip 6.8 k Ohm ± 5% 1/16 W	NN05682610
RV87			Resistor, Chip 33 Ohm ± 5% 1/16 W	NN05330610
RV89			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RV90			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RV91			Resistor, Chip 3.3 k Ohm ± 5% 1/16 W	NN05332610
RW01			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW02			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW03			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW04			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW05			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW06			Resistor 150 Ohm ± 5% 1/6 W	GD05151160
RW11			Resistor 1 k Ohm ± 5% 1/6 W	GD05102160
RW12			Resistor 1 k Ohm ± 5% 1/6 W	GD05102160
RW14			Resistor, Chip 1 M Ohm ± 5% 1/6 W	GD05105160
RW15			Resistor, Chip 1 M Ohm ± 5% 1/6 W	GD05105160
RX01			Resistor, Chip 1 k Ohm ± 1% 1/16 W	NM11002020
RX02			Resistor, Chip 1 k Ohm ± 1% 1/16 W	NM11002020
RX03			Resistor, Chip 1 k Ohm ± 1% 1/16 W	NM11002020
RX04			Resistor, Chip 1 k Ohm ± 1% 1/16 W	NM11002020
RX05			Resistor 1 k Ohm ± 5% 1 W	GA05102010
RX06			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX07			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX08			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX09			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX10			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX11			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX12			Resistor, Chip 470 Ohm ± 5% 1/16 W	NN05471610
RX13			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX21			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX22			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX23			Resistor 100 Ohm ± 5% 1/6 W	GG05101160
RX24			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX25			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX26			Resistor 100 Ohm ± 5% 1/6 W	GG05101160
RX27			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX28			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX29			Resistor 100 Ohm ± 5% 1/6 W	GG05101160
RX41			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX42			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX43			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX44			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX45			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX46			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX47			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX48			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX49			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RX50		U30001→	Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY01			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY02			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY03			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY04			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY05			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
RY06			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY07			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY08			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY09			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY10			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY11			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY12			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610
RY13			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY14			Resistor, Chip 10 k Ohm ± 5% 1/16 W	NN05103610
RY15			Resistor, Chip 1 k Ohm ± 5% 1/16 W	NN05102610
RY16			Resistor, Chip 100 k Ohm ± 5% 1/16 W	NN05104610

MISCELLANEOUS ELECTRICAL

A101			Unit Kit Tuner Pack BSFC78GY6	ZK395B0010
AA10			PCB LCD Module	443B493J00
D101			Diode, Chip D1F60-4063	HZ20001290
D102			Diode, Chip D1F60-4063	HZ20001290
D103			Diode, Chip D1F60-4063	HZ20001290
D104			Diode, Chip 1SS301	HZ21005000
D105			Diode,-Pin, Chip HVM14S (TR)	HZ50003010
D251			Diode, Chip HSU88	HZ20053010
D252			Diode, Chip HSU88	HZ20053010
D301			Diode, Chip 1SS271	HZ20063050
D302			Diode, Chip 1SS271	HZ20063050
D402			Diode, Chip HVU306A	HZ40006010
D521			Diode, Chip HN2S01FU	HZ20058050
D551			Diode, Chip 1SS301	HZ21005000
D552			Diode, Chip 1SS302	HZ20018050
D571			Diode, Chip 1SS301	HZ21005000
D572			Diode, Chip MA8062	HZ30621000
D601			Diode, Chip 1SS301	HZ21005000
D602			Diode, Chip 1SS301	HZ21005000
D603			Diode, Chip 1SS301	HZ21005000
D651			Diode, Chip HN2S01FU	HZ20058050
D652			Diode, Chip 1SS301	HZ21005000
D801			Diode RL103E OR DSF10C	HD20003000
D802			Diode RL103E OR DSF10C	HD20003000
D803			Diode, Zener 15 V Zener Equivalent	HD31501000
D804			Diode, Zener 15 V Zener Equivalent	HD31501000
D811			Diode D3SB20	HE20020290
D812			Diode RL103E or DSF10C	HD20003000
D813			Diode RL103E or DSF10C	HD20003000
D814			Diode RL103E or DSF10C	HD20003000
D821			Diode D3SB20	HE20020290
D822			Diode RL103E or DSF10C	HD20003000
D823			Diode RL103E or DSF10C	HD20003000
D831			Diode D3SB20	HE20020290
D841			Diode D3S4M-4004P15	HD20039290
D842			Diode, Zener MTZJ24	HD32401000
D861			Diode D3S4M-4004P15	HD20039290
D862			Diode, Zener MTZJ6.2B	HD30621000
D901			Diode, Chip 1SS301	HZ21005000
D941			Diode, Chip 1SS301	HZ21005000
D971			Diode, Chip 1SS301	HZ21005000
DB11			Diode, Chip 1SV217	HZ40014050
DB41			Diode, Chip 1SV217	HZ40014050
DB71			Diode, Chip 1SV217	HZ40014050
DC11			Diode, Chip 1SS314	HZ20029050
DC12			Diode, Chip 1SS314	HZ20029050
DC13			Diode, Chip 1SS314	HZ20029050
DC14			Diode, Chip 1SS314	HZ20029050

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
DC15			Diode, Chip 1SS314	HZ20029050
DC16			Diode, Chip 1SS314	HZ20029050
DC41			Diode, Chip 1SS314	HZ20029050
DC42			Diode, Chip 1SS314	HZ20029050
DC43			Diode, Chip 1SS314	HZ20029050
DC44			Diode, Chip 1SS314	HZ20029050
DC45			Diode, Chip 1SS314	HZ20029050
DC46			Diode, Chip 1SS314	HZ20029050
DC47			Diode, Chip 1SS314	HZ20029050
DC48			Diode, Chip 1SS314	HZ20029050
DC49			Diode, Chip 1SS314	HZ20029050
DC50			Diode, Chip 1SS314	HZ20029050
DC71			Diode, Chip 1SS314	HZ20029050
DC72			Diode, Chip 1SS314	HZ20029050
DC73			Diode, Chip 1SS314	HZ20029050
DC74			Diode, Chip 1SS314	HZ20029050
DC75			Diode, Chip 1SS314	HZ20029050
DC76			Diode, Chip 1SS314	HZ20029050
DC77			Diode, Chip 1SS314	HZ20029050
DC78			Diode, Chip 1SS314	HZ20029050
DC79			Diode, Chip 1SS314	HZ20029050
DC80			Diode, Chip 1SS314	HZ20029050
DD11			Diode, Chip 1SS302	HZ20018050
DD41			Diode, Chip 1SS302	HZ20018050
DD71			Diode, Chip 1SS302	HZ20018050
DE41			Diode, Chip 1SS301	HZ21005000
DE42			Diode, Chip 1SS301	HZ21005000
DE71			Diode, Chip 1SS301	HZ21005000
DE72			Diode, Chip 1SS301	HZ21005000
DF11			Diode, Chip 1SS314	HZ20029050
DF12			Diode, Chip 1SS314	HZ20029050
DF31			Diode, Chip 1SS314	HZ20029050
DF32			Diode, Chip 1SS314	HZ20029050
DF51			Diode, Chip 1SS314	HZ20029050
DF52			Diode, Chip 1SS314	HZ20029050
DF71			Diode, Chip 1SS314	HZ20029050
DF72			Diode, Chip 1SS314	HZ20029050
DG01			Diode, Chip 1SS302	HZ20018050
DH11			Diode, Chip 1SS314	HZ20029050
DH12			Diode, Chip 1SS314	HZ20029050
DH21			Diode, Chip 1SS314	HZ20029050
DH22			Diode, Chip 1SS314	HZ20029050
DH31			Diode, Chip 1SS314	HZ20029050
DH32			Diode, Chip 1SS314	HZ20029050
DH41			Diode, Chip 1SS314	HZ20029050
DH42			Diode, Chip 1SS314	HZ20029050
DM01			Diode, Chip 1SS301,DAN202U UMT-Type	HZ21005000
DM02			Diode, Chip 1SS302	HZ20018050
DR01			LED HLMF-K500 Green (HP)	HI10008340
DR02			LED HLMF-K500 Green (HP)	HI10008340
DR03			LED HLMF-K500 Green (HP)	HI10008340
DR04			LED HLMF-K500 Green (HP)	HI10008340
DR05			LED HLMF-K200 Red (HP)	HI10005340
DR05		U010001→	LED HLMF-K200 Red (HP)	HI10008340
DR06			LED HLMF-K200 Red (HP)	HI10005340
DR07			LED Green HSMG-C670	HI10004340
DR07		U020001→	LED Green HSMG-C670	HI10105210
DR08			LED Green HSMG-C670	HI10004340
DR08		U020001→	LED Green HSMG-C670	HI10105210
DR09			LED Green HSMG-C670	HI10004340

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
DR097		U020001→	LED Green HSMG-C670	HI10105210
DR10			LED Green HSMG-C670	HI10004340
DR10		U020001→	LED Green HSMG-C670	HI10105210
DR11			LED Green HSMG-C670	HI10004340
DR11		U020001→	LED Green HSMG-C670	HI10105210
DR12			LED Green HSMG-C670	HI10004340
DR12		U020001→	LED Green HSMG-C670	HI10105210
DR13			LED Green HSMG-C670	HI10004340
DR13		U020001→	LED Green HSMG-C670	HI10105210
DR14			LED Green HSMG-C670	HI10004340
DR14		U020001→	LED Green HSMG-C670	HI10105210
DR15			LED Green HSMG-C670	HI10004340
DR15		U020001→	LED Green HSMG-C670	HI10105210
DR16			LED Green HSMG-C670	HI10004340
DR16		U020001→	LED Green HSMG-C670	HI10105210
DR17			LED Green HSMG-C670	HI10004340
DR17		U020001→	LED Green HSMG-C670	HI10105210
DR18			LED Green HSMG-C670	HI10004340
DR18		U020001→	LED Green HSMG-C670	HI10105210
DR19			LED Green HSMG-C670	HI10004340
DR19		U020001→	LED Green HSMG-C670	HI10105210
DR20			LED Green HSMG-C670	HI10004340
DR20		U020001→	LED Green HSMG-C670	HI10105210
DR21			LED Green HSMG-C670	HI10004340
DR21		U020001→	LED Green HSMG-C670	HI10105210
DR22			LED Green HSMG-C670	HI10004340
DR22		U020001→	LED Green HSMG-C670	HI10105210
DR23			LED Green HSMG-C670	HI10004340
DR23		U020001→	LED Green HSMG-C670	HI10105210
DR24			LED Green HSMG-C670	HI10004340
DR24		U020001→	LED Green HSMG-C670	HI10105210
DR25			LED Green HSMG-C670	HI10004340
DR25		U020001→	LED Green HSMG-C670	HI10105210
DR26			LED Green HSMG-C670	HI10004340
DR26		U020001→	LED Green HSMG-C670	HI10105210
DR27			LED Green HSMG-C670	HI10004340
DR27		U020001→	LED Green HSMG-C670	HI10105210
DR28			LED Green HSMG-C670	HI10004340
DR28		U020001→	LED Green HSMG-C670	HI10105210
DR29			LED Green HSMG-C670	HI10004340
DR29		U020001→	LED Green HSMG-C670	HI10105210
DR30			LED Green HSMG-C670	HI10004340
DR30		U020001→	LED Green HSMG-C670	HI10105210
DR31			LED Green HSMG-C670	HI10004340
DR31		U020001→	LED Green HSMG-C670	HI10105210
DR32			LED Green HSMG-C670	HI10004340
DR32		U020001→	LED Green HSMG-C670	HI10105210
DR33			LED Green HSMG-C670	HI10004340
DR33		U020001→	LED Green HSMG-C670	HI10105210
DR34			LED Green HSMG-C670	HI10004340
DR34		U020001→	LED Green HSMG-C670	HI10105210
DR35			LED Green HSMG-C670	HI10004340
DR35		U020001→	LED Green HSMG-C670	HI10105210
DR36			LED Green HSMG-C670	HI10004340
DR36		U020001→	LED Green HSMG-C670	HI10105210
DR37			LED Green HSMG-C670	HI10004340
DR37		U020001→	LED Green HSMG-C670	HI10105210
DR38			LED Green HSMG-C670	HI10004340
DR38		U020001→	LED Green HSMG-C670	HI10105210

REF DES	EFFECTIVITY MODEL	SERIAL NO.	DESCRIPTION	PART NUMBER
DR39			LED Green HSMG-C670	HI10004340
DR39		U020001→	LED Green HSMG-C670	HI10105210
DR40			LED Green HSMG-C670	HI10004340
DR40		U020001→	LED Green HSMG-C670	HI10105210
DR41			LED Green HSMG-C670	HI10004340
DR41		U020001→	LED Green HSMG-C670	HI10105210
DR42			LED Green HSMG-C670	HI10004340
DR42		U020001→	LED Green HSMG-C670	HI10105210
DR43			LED Green HSMG-C670	HI10004340
DR43		U020001→	LED Green HSMG-C670	HI10105210
DR44			LED Green HSMG-C670	HI10004340
DR44		U020001→	LED Green HSMG-C670	HI10105210
DR45			LED Green HSMG-C670	HI10004340
DR45		U020001→	LED Green HSMG-C670	HI10105210
DR46			LED Green HSMG-C670	HI10004340
DR46		U020001→	LED Green HSMG-C670	HI10105210
DR47			LED Green HSMG-C670	HI10004340
DR47		U020001→	LED Green HSMG-C670	HI10105210
DR48			LED Green HSMG-C670	HI10004340
DR48		U020001→	LED Green HSMG-C670	HI10105210
DR49			LED Green HSMG-C670	HI10004340
DR49		U020001→	LED Green HSMG-C670	HI10105210
DR50			LED Green HSMG-C670	HI10004340
DR50		U020001→	LED Green HSMG-C670	HI10105210
DR51			LED Green HSMG-C670	HI10004340
DR51		U020001→	LED Green HSMG-C670	HI10105210
DR52			LED Green HSMG-C670	HI10004340
DR52		U020001→	LED Green HSMG-C670	HI10105210
DR53			LED Green HSMG-C670	HI10004340
DR53		U020001→	LED Green HSMG-C670	HI10105210
DR54			LED Green HSMG-C670	HI10004340
DR54		U020001→	LED Green HSMG-C670	HI10105210
DR55			LED Green HSMG-C670	HI10004340
DR55		U020001→	LED Green HSMG-C670	HI10105210
DR56			LED Green HSMG-C670	HI10004340
DR56		U020001→	LED Green HSMG-C670	HI10105210
DR57			LED Green HSMG-C670	HI10004340
DR57		U020001→	LED Green HSMG-C670	HI10105210
DR58			LED Green HSMG-C670	HI10004340
DR58		U020001→	LED Green HSMG-C670	HI10105210
DR59			LED Green HSMG-C670	HI10004340
DR59		U020001→	LED Green HSMG-C670	HI10105210
DR60			LED Green HSMG-C670	HI10004340
DR60		U020001→	LED Green HSMG-C670	HI10105210
DR61			LED Green HSMG-C670	HI10004340
DR61		U020001→	LED Green HSMG-C670	HI10105210
DR62			LED Green HSMG-C670	HI10004340
DR62		U020001→	LED Green HSMG-C670	HI10105210
DR63			LED Green HSMG-C670	HI10004340
DR63		U020001→	LED Green HSMG-C670	HI10105210
DR64			LED Green HSMG-C670	HI10004340
DR64		U020001→	LED Green HSMG-C670	HI10105210
DR65			LED Green HSMG-C670	HI10004340
DR65		U020001→	LED Green HSMG-C670	HI10105210
DR66			LED Green HSMG-C670	HI10004340
DR66		U020001→	LED Green HSMG-C670	HI10105210
DR67			LED Green HSMG-C670	HI10004340
DR67		U020001→	LED Green HSMG-C670	HI10105210
DR68			LED Green HSMG-C670	HI10004340

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
DR68		U020001→	LED Green HSMG-C670	HI10105210
DR69			LED Green HSMG-C670	HI10004340
DR69		U020001→	LED Green HSMG-C670	HI10105210
DR70			LED Green HSMG-C670	HI10004340
DR70		U020001→	LED Green HSMG-C670	HI10105210
DR71			LED Green HSMG-C670	HI10004340
DR71		U020001→	LED Green HSMG-C670	HI10105210
DR72			LED Green HSMG-C670	HI10004340
DR72		U020001→	LED Green HSMG-C670	HI10105210
DR73			LED Green HSMG-C670	HI10004340
DR73		U020001→	LED Green HSMG-C670	HI10105210
DR74			LED Green HSMG-C670	HI10004340
DR74		U020001→	LED Green HSMG-C670	HI10105210
DU01			Diode, Chip LM4040AIM-5.0	HZ30002360
DU02			Diode, Chip 1SS301	HZ21005000
DU03			Diode, Chip 1SS301	HZ21005000
DU04			Diode, Chip 1SS301	HZ21005000
DU05			Diode, Chip 1SS301	HZ21005000
DU06			Diode, Chip 1SS301	HZ21005000
DU08			Diode, Chip LM4040AIM-2.5	HZ30001360
DU09			Diode, Chip 1SS322	HZ20031050
DV01			Diode, Chip 1SS302	HZ20018050
DV02			Diode, Chip 1SS302	HZ20018050
DV03			Diode, Chip 1SS302	HZ20018050
DV04			Diode, Chip 1SS301, DAN202U UMT-Type	HZ21005000
DW01			Diode 1SS133	HD20002000
DW02			Diode 1SS133	HD20002000
DW03			Diode 1SS133	HD20002000
DW04			Diode 1SS133	HD20002000
DW11			Diode, Zener 15 V Zener Equivalent	HD31501000
DW12			Diode, Zener 15 V Zener Equivalent	HD31501000
DW13			Diode, Zener 15 V Zener Equivalent	HD31501000
DW14			Diode, Zener 15 V Zener Equivalent	HD31501000
DW15			Diode, Zener 15 V Zener Equivalent	HD31501000
DW16			Diode, Zener 15 V Zener Equivalent	HD31501000
DW17			Diode, Zener 15 V Zener Equivalent	HD31501000
DW18			Diode, Zener 15 V Zener Equivalent	HD31501000
DW19			Diode, Zener 15 V Zener Equivalent	HD31501000
DW20			Diode, Zener 15 V Zener Equivalent	HD31501000
DW21			Diode, Zener 15 V Zener Equivalent	HD31501000
DW22			Diode, Zener 15 V Zener Equivalent	HD31501000
DX01			Diode, Chip 1SS302	HZ20018050
DX02			Diode, Chip 1SS302	HZ20018050
DX03		U30001→	Diode, Chip 1SS302	HZ20018050
DX10			Diode RL103E	HD20003000
DX11			Diode SB10-03A3	HD20044030
DY01			Diode, Chip 1SS302	HZ20018050
DY02			Diode, Chip 1SS302	HZ20018050
F001			Fuse 250 V 0.63 A 20 mm	FS10063850
J001			Jack AC Inlet 6200-2100	YJ04002470
J011			Jack BNC-RCA Video #1	YJ10002500
J012			Jack BNC-RCA Video #2	YJ10002500
J013			Jack BNC-RCA Composite	YJ10002500
J021			Jack BNC-RCA Video Test	YJ10002500
J022			Jack BNC-RCA 70 MHz IF Test	YJ10002500
J031			Jack F-RCA 70 MHz IF Loop Out	YJ10003060
J032			Jack F-RCA 70 MHz IF Loop In	YJ10003060
J041			Plug Terminal MC-1.5/12-STF-3.81	YP06021520
J101			Jack F 01K0085 - 00	YJ10002260
J102			Jack F 01K0085 - 00	YJ10002260

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
J103			Jack F 01K0085 - 00	YJ10002260
J104			Jack F 01K0085 - 00	YJ10002260
J105			Jack RCA Jack	YJ10003050
J106			Jack PH-12-Pin	YJ06006520
J107			Resistor, Chip 0 Ohm ± 5% 1/16 W	GD05000160
J108			Jack CA-1-2 (Tuner Out-J108)	YJ06031490
J201			Plug Minipin - 70MHz IF In	YP06006400
J202			Plug Minipin - CMF900 In	YP06006400
J203			Jack Minipin - CMF900 Out	YJ07000350
J204			Jack Minipin - IF Test Out	YJ07000350
J205			Jack Minipin - IF OUT(Rear)	YJ07000350
J206			Jack Minipin - Demo Test	YJ07000350
J301			Jack Minipin - Audio PCB	YJ07000350
J401			Jack RCA for 612 MHz Input	YJ10002320
J402			Jack RCA for 70 MHz Output	YJ10002320
J404			Jack Minipin for Test	YJ07000350
J405			Jack Minipin for Local Out Test	YJ07000350
J501			Jack B4B-PH-K-S	YJ06006240
J601		U30001→	Jack B2B-PH-K-S	YJ06006220
J801			Plug	YP06010980
J802			Terminal Earth Lug	YL01010240
J901			Jack Audio Control In	YJ06006230
JA11			Jack B5B-PH-K-S Demo Cal #1	YJ06006250
JA41			Jack B5B-PH-K-S Demo Cal #1	YJ06006250
JA71			Jack B5B-PH-K-S Demo Cal #1	YJ06006250
JB01			Plug Minipin for Audio Subcarrier In	YP06006400
JB02			Jack Audio Detector Out	YJ06006260
JB03			Jack FH10A-30S-1SH	YJ07016620
JB12			Jack Minipin for B pF Test #1 Out	YJ07000350
JB42			Jack Minipin for B pF Test #2 Out	YJ07000350
JB72			Jack Minipin for B pF Test #3 Out	YJ07000350
JD01			Jack Audio Control In	YJ06006260
JD02			Jack FH10A-30S-1SH	YJ07016620
JD03			Plug B9B-EH	YP06011710
JD04			Jack B9B-PH	YJ06006290
JG01			Jack Minipin Vertical	YJ07000350
JH01			Plug Minipin	YP06006400
JH02			Plug M Minipin	YP06006400
JH03			Jack S10B-PH-K-S	YJ06006300
JK01			Jack S9B-PH-K-S	YJ06006490
JK11			Jack Phones Jack	YJ01003340
JK21			Jack Phones Jack	YJ01003340
JK31			Jack Phones Jack	YJ01003340
JL01			Jack BH 9B-PH	YJ07020770
JL02			Jack B9B-PH-K-S	YJ06006290
JL03			Jack B12B-PH-K-S	YJ06006320
JR01			Jack FH10A-30S-1SH	YJ07016620
JR02			Jack 521610-0690	YJ07020780
JR03			Jumper Lead	YU02012700
JR04			Jumper Lead	YU02012700
JS01			Connective Cord JS01 to JU05	YB00051470
JT01			Connective Cord JT01 to JU04	YB00051470
JU01			Jack FH21-6S-1DSA	YJ07019870
JU02			Jack FH21-30S-1DSA	YJ07019860
JU03			Jack FH21-30S-1DSA	YJ07019860
JU04			Jack B3B-PH-K-G	YJ06006230
JU05			Jack B3B-PH-K-G	YJ06006230
JU06			Plug B4B-EH	YP06003910
JU52		→U30001	Jack IC Socket 8-Pin DIP	YJ90000690
JU53		→U30001	Jack IC Socket 32-Pin PLCC	YJ07020760

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
JV01			Jack Minipin Vertical	YJ07000350
JV02			Jack Minipin Vertical	YJ07000350
JV03			Jack Minipin Vertical	YJ07000350
JV10			Plug B15B-EH-A	YP06012350
JV11			Jack SSW-105-06-G-D-LL	YJ07016650
JV12			Jack SSW-105-06-G-D-LL	YJ07016650
JW01			Jack XLM-3-32PCV Audio Output #1	YJ01003810
JW02			Jack XLM-3-32PCV Audio Output #2	YJ01003810
JW03			Jack XLM-3-32PCV Audio Output #3	YJ01003810
JW04			Plug B9B-EH	YP06011710
JW05			Jack MC 1,5/12-GF-3,81	YJ06031360
JW06			Jack DELC-J9PAF-20L9	YJ90001220
JW08			Jack B14B-PH-K-S	YJ06006340
JX01			Jack FH21-30S-1DSA	YJ07019860
JX02			Jack FH21-30S-1DSA	YJ07019860
JX03			Jack FH21-30S-1DSA	YJ07019860
JX04			Jack B14B-PH-K-S	YJ06006340
JX05			Plug RE-H062TD-1130	YP06021490
JX06			Jack B10B-PH-K-S	YJ06006300
JZ01			Jack TSW-105-23-G-D-LL	YJ07016660
JZ02			Jack TSW-105-23-G-D-LL	YJ07016660
K002			Unit Kit LCD Panel	ZK396B0020
LW01			Relay EA2-5NU AUX Relay	LY20050120
LW02			Relay EA2-5NU Alarm Relay	LY20050120
LY01			Relay EA2-5NU	LY20050120
LY02			Relay EA2-5NU	LY20050120
M001			Meter, DC IM11045060	IM11045060
P001			PC Board Display PCB	WI443B1000
P002			PC Board Microprocessor PCB	WI443B2000
P003			PC Board Audio PCB	WG443B1000
P004			PC Board PCB Complex 1	WG443B2000
P005			PC Board PCB Complex 2	WG443B3000
P006			PC Board Main PCB	WG443B4000
P101			PC Board RF Module PCB	WG443B3010
P401			PC Board IF Module PCB	WG443B3020
P801			PC Board Power Supply PCB	WG443B2010
PB01			PC Board Audio IF PCB	WG443B1010
PD01			PC Board Audio Control PCB	WG443B1020
PH01			PC Board IF Filter PCB	WG443B3030
PK01			PC Board Head Phone PCB	WG443B2030
PR01			PC Board Display PCB	WI443B1010
PS01			PC Board Select Knob PCB	WG443B2040
PT01			PC Board Menu Knob PCB	WG443B2050
PU01			PC Board Microprocessor PCB	WI443B2010
PV01			PC Board Main PCB	WG443B4010
PW01			PC Board Output PCB	WG443B2020
PZ01			PC Board Option Filter PCB	WG443B3040
SG01			Switch, Slide SSSS222 Composite Inversion	SS02020910
SR01			Switch, Push SKQHFH	SP01013290
SR02			Switch, Push SKQHFJ	SP01013300
SR03			Switch, Push SKQHFH	SP01013290
SR04			Switch, Push SKQHFH	SP01013290
SR05			Switch, Slide SSSF012-S09N0	SS01021110
SR06			Switch, Slide SSSF013-S09N0	SS01030380
SR07			Switch, Slide SSSF022-S09NO	SS02021700
SS01			Switch, Rotary Select Switch	SR01240010
ST01			Switch, Rotary Menu Switch	SR01120100
SV01			Switch, Slide SSSS222 Video Inversion	SS02020910
S001			Switch, Slide Voltage Selector DPDT	SS02021290
TP01			Resistor, Chip Checker	NI00999000
T001			Transformer, Power 120 V / 240 V	TS16808270

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
W008			Connective Cord JK01 to JD03	YB00062730
W009			Connective Cord JX04 to JW08	YB00051480
W010			Connective Cord JL03 to J106	YB00083060
W011			Connective Cord JL01 to JL02	YB00111400
W012			Connective Cord JX06 to JH03	YB00123170
W013			Connective Cord JD01 to JB02	YB00142240
W014			Connective Cord JD03 to JW04	YB00800560
W015			Connective Cord GND to AC Inlet	YB00123200
W021			Connective Cord JV01 to Video #1	YB00105860
W022			Connective Cord JV02 to Video #2	YB00105860
W023			Connective Cord J202 to JH01	YB00123190
W024			Connective Cord J202 to JH02	YB00123190
W025			Connective Cord J105 to J401	YB00123180
W026			Connective Cord J402 to 70 MHz IF Out	YB00142260
W027			Connective Cord JG01 to Composite Out	YB00142250
W027		U30001→	Connective Cord JG01 to Composite Out	YB00152700
W028			Connective Cord J301 to JB01	YB00261990
W029			Connective Cord J201 to 70 MHz IF IN	YB00270880
W030			Connective Cord J204 to 70 MHz IF Test	YB00304480
W031			Connective Cord JV03 to Video Test	YB00800570
W081			Power Cord, AC	ZC02002080
W082			Connective Cord F-F IF Loop Through	YB00150560
W083			Connective Cord RS-232C Cable	YB00601120
W801			Connective Cord Power Supply to JV10	YB00051460
WA01			Lead, Jumper JU01 to JR02	YU06067520
WA02			Lead, Jumper JX01 to JU02	YU30067520
WA03			Lead, Jumper JX02 to JB03	YU30067520
WA04			Lead, Jumper JX03 to JD02	YU30067520
WA05			Lead, Jumper JU03 to JR01	YU30067520
WB01			Connective Cord Audio IF Jumper-1	YB00072240
WB02			Connective Cord Audio IF Jumper-2	YB00072240
XB01			Crystal 12 MHz Crystal Audio PLL	JX12012260
XL01			Crystal 8.0000 MHz HC49/U	XH126001G0
XU01			Crystal MA-505-29.491M-C1	JX29001320
XU02			Crystal MC-405-32.768K-A2	JX00001320
ZU01			Battery BR2325-1HB	ZB09150010

MISCELLANEOUS NONELECTRICAL

1			Shield for 2nd Converter	9999999999
2			Support for PCB	9999999999
002B			Front Panel Front Panel MT930B	443B248010
002D			Lid	396B257020
002G			Chassis Bottom Assembly	443B105500
002L			Heat Sink	141S267010
004B			Window LCD	396B158010
004D			Screw, P.H. Tap for Lid, Rear	51270308U0
004G			Chassis Bottom	443B105010
004L			Bracket for Heat Sink	141S160020
006B			Window Status Window	443B158010
006D			Screw, B.H. Tap for Lid, Side	51280406U0
006G			Stay for Bottom	396B126010
006L			Screw, B.H. Tap Heat Sink + Bracket	51280310U0
008B			Badge Standard Badge	012S251010
008D			Label FCC Label for Chassis	375S861010
008G			Stopper for Chassis Side	030J114010
008L			Screw, B.H. Metal Heat Sink Unit + Bottom	51100304A9
008L		U30001→	Screw, B.H. Metal Heat Sink Unit + Bottom	51100304U0
010B			Screw, F.H. Tap for Front Panel Bottom	51500308U0
010D			Label for UL	117H861020
010G			Rear Panel	443B250010
010L			Support for Chassis	355K101010

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
012B			Screw, B.H. Tap for Front Panel Upper	51280306A0
012G			Screw, B.H. Tap for Rear Panel	51280306A0
012L			Screw, B.H. Metal for Power Supply PCB	51100306A9
013L			Insulator for Power Supply PCB	443B120020
014B			Button for LCD PCB	396B270010
014L			Leaf Spring for Heat Sink	140S116010
015B			Insulator Sheet for Button	484C120010
016B			Knob for VOL.	396B154010
016L			Screw, B.H. Tap Leaf Spring + Heat Sink	51280310U0
018B			Handle for Chassis Side	121S253010
018G			Label Caution for Insulator	396B861050
018L			Buffer for P801 R842	170S056060
020B			Screw, B.H. Tap for Handle	51280310U0
020G			Bracket Front	443B160010
022G			Screw, B.H. Tap Front Bracket + Chassis	51280308A0
022G		U030001→	Screw, B.H. Tap Front Bracket + Chassis	51280306A0
024G			Bracket Phone Jack	443B160020
026G			Nut for Phone Jack	075S011010
028G			Screw, B.H. Tap PJ Bracket + F Bracket	51280308A0
028G		U030001→	Screw, B.H. Tap PJ Bracket + F Bracket	51280306A0
030G			Support PJ PCB + Bottom	443B101010
032G			Screw, B.H. Metal for Phone Jack PCB	51100306A9
034G			Spacer LED for LCD PCB	081S118140
036G			Retainer LED for LCD PCB	443B104010
038G			Holder LCD Holder	443B271010
040G			Sheet LCD Sheet	443B107010
042G			Spacer LCD Spacer	396B118010
044G			Screw, B.H. Metal for LCD PCB	51100304A0
044G		U30001→	Screw, B.H. Metal for LCD PCB	51100304U0
046G			Buffer for LCD PCB (LCD Side)	129J056010
048G			Buffer for LCD PCB (IC Side)	215C056010
050G			Buffer for Meter	396B056010
052G			Buffer for F Bracket (Meter)	010C056020
060G			Washer, Screw, Flat for Transformer	51480406A0
062G			Buffer for Bottom	019J056020
064G			Screw, B.H. Metal for Microprocessor PCB	51100306A0
066G			Support for audio PCB (Bottom)	249S101010
068G			Screw, B.H. Metal for Audio PCB (Upper)	51100306A9
070G			Screw, B.H. Metal for Main PCB	51100306A9
071G			Buffer for Main PCB	019J056020
072G			Shield Case for Main PCB	394B109010
074G			Shield Lid for Main PCB	394B109020
076G			Support for Main PCB	249S101010
078G			Sheet for Main PCB (Upper)	251S107010
080G			Screw, B.H. Metal for Main PCB (Upper)	51100306A9
082G			Screw, B.H. Metal for Rear PCB	51100306A9
084G			Insulator for Chassis	443B120010
086G			Clamp Push Rivets for Insulator	145S005030
088G			Bracket Handle for Chassis Side	121S160040
090G			Screw, B.H. Tap for Handle Bracket	51280308A0
090G		U30001→	Screw, B.H. Tap for Handle Bracket	51280306A0
092G			Screw for GND Bottom	371K010010
092G		U30001→	Screw for GND Bottom	371K010020
094G		→U30001	Spring Washer for GND	54040402N0
096G			Washer, Toothed for GND	54050400R0
098G			Label GND for Bottom	281H861060
100G			Label Caution for Insulator	396B861050
102G		→U30001	Buffer for PV01 FX01	170S056060
106G		U010001→	Washer, Flat, Plated for 0P PCB	54020201A0
108G		U010001→	Screw, B.H. Metal for 0P PCB	51100206A0

REF DES	EFFECTIVITY MODEL	EFFECTIVITY SERIAL NO.	DESCRIPTION	PART NUMBER
150G			Shield RF Case	443B109010
152G			Shield RF Partition for PCB	443B109030
154G			Spring Leaf for PCB	101C115040
156G			Shield RF Lid	180C109170
158G			Shield RF Bottom	443B109020
159G			Shield Lid for Tuner Pack	443B109050
160G			Screw, B.H. Metal RF Unit + Chassis	51100304A0
160G		U30001→	Screw, B.H. Metal RF Unit + Chassis	51100304U0
200G			Shield IF Case	141S109010
202G			Buffer for IF PCB	170S056060
204G			Shield IF Lid	141S109220
206G			Shield IF Bottom	180C109110
208G			Screw, B.H. Metal IF Unit + Chassis	51100304A0
208G		U30001→	Screw, B.H. Metal IF Unit + Chassis	51100304U0
210G			Buffer for RX50	170S056060
902G			Lock I/0 for AC Inlet	396B102010
904G			Bracket for AC Inlet	443B160030
906G			Screw, B.H. Metal for AC Inlet	51100310A0
908G			Screw, B.H. Tap for Volume Select	51280308A0
910G			Screw, B.H. Metal for Canon Connector	51100306A9
912G			Terminal GND	YL03010280
914G			Label for Volume Select	443B861020

Standard Communications Corp.

Satellite & Broadband Products Division Limited Warranty

Standard Communications Corp. (SCC) warrants, to the original purchaser (the "Purchaser") only, that each new Satellite & Broadband product will be free from defects in materials and workmanship under conditions of normal use and service for a period of one (1) year from the date of delivery to the Purchaser. SCC's liability under this warranty shall be limited to repair or replacement of the defective product, at SCC's option, and under no circumstances shall SCC be liable for consequential, incidental or other damages arising out of or in any way connected with a failure of the product to perform as set forth herein.

THIS LIMITED WARRANTY EXTENDS ONLY TO THE PURCHASER AND IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In the event of a defect, malfunction, or failure of the product to conform to specifications during the one-year warranty period, SCC will repair or replace, at its option and without charge to the Purchaser, the product which upon examination by SCC shall appear to be defective or not up to factory specifications. SCC will pay all labor charges incurred in providing such warranty service. To obtain warranty service, the Purchaser must first obtain a repair order (R.O.) number from SCC. The defective product must then be returned to SCC freight prepaid. SCC will examine the product and respond to the Purchaser in approximately four (4) weeks from the date of receipt of the product claimed to be defective.

This limited warranty does not extend to any product which has been subjected to misuse, neglect, accident, improper installation, or subject to use in violation of the maintenance or operating instructions, if any, furnished by SCC; nor does this warranty extend to products on which the serial number has been removed, defaced, or changed.

SCC reserves the right to make changes or improvements to its products during subsequent production, without incurring the obligation to install such changes or improvements on previously manufactured or sold products.

This warranty gives you specified legal rights that vary from state to state. Because some states do not allow limitations on the duration of the warranty, or exclusions or limitations of incidental or consequential damages, these limitations or exclusions may not apply to you.

DOMESTIC GOLD STANDARD SUPPORT PROGRAM

The Gold Standard Support Program is designed to provide domestic users of our commercial systems the best possible support and service available. Here is how the program works:

SEVEN-YEAR GUARANTEE

In the event of technical problems requiring SCC-factory repair during the first 12 months from purchase date, SCC will warrant the cost, including parts and labor, as specified in SCC's Satellite & Broadband Products Division Limited Warranty policy. During the next 6 years following expiration of the original warranty, the maximum service charge will be $150.00, and recertification of MT930B units will be an additional $150.00. Whenever possible, SCC will attempt to upgrade performance to the latest improved specification, while remaining below the maximum service charge. Qualifying merchandise must be assigned an SAR (Satellite & Broadband Advance Repair) number by SCC's Customer Service administrator. The equipment then can be shipped to SCC, freight prepaid. SCC will return the equipment, freight prepaid, via FedEx Standard Air, unless otherwise specified, at the customer's expense. Repair charges will be applied at the out-of-warranty rate in the event of physical or electrical abuse to in-warranty equipment.

LIFETIME LOANER PROGRAM

This program has been established to minimize downtime resulting from SCC equipment failure in critical service situations. The program is provided FREE (excluding freight) for the life of the qualifying SCC-manufactured equipment. In the event that any SCC-manufactured equipment covered under the loaner program fails during normal operation, SCC will provide a compatible SCC loaner unit to the customer to sustain present operations for the duration of time it takes SCC to repair and return the customer's unit. To qualify for this program, the customer must have a current open-terms account in good standing with SCC, and provide a purchase order for the estimated freight costs. A special 24-hour shipping program has been arranged with FedEx.* All shipping arrangements are taken care of by the SCC Customer Service Administrator. The customer will receive a package consisting of: (a) a special shipping case; (b) SCC-specified loaner equipment; and (c) shipping and agreement documents. A purchase order number must be provided for the estimated shipping costs before the loaner equipment is delivered (customer pays shipping). The customer must return the defective equipment to SCC, freight prepaid, in the supplied shipping case, within 48 hours of receiving the loaner equipment. SCC will return the repaired equipment, freight prepaid. The customer must then return the loaner equipment to SCC, freight prepaid, in the supplied case within 72 hours of receiving the repaired equipment. If the loaner equipment is not shipped within 72 hours, a daily rental fee, not to exceed five percent of the net cost of the equipment, will be charged to the customer's account until SCC's loaner equipment is returned. Please call the Satellite & Broadband Products Division's Customer Service Administrator at Extension 316 for additional information on qualifying equipment and procedures.

CLAIMS

Claims for erroneous charges, or price corrections must be presented within 30 days of invoice date. Freight damage claims should be filed directly with the delivering carrier within seven days. NEW and UNOPENED EQUIPMENT may be returned for credit with prior approval from SCC within 30 days of invoice date. A 20-percent processing and handling charge will be assessed on any new items returned for credit. Please call the Satellite & Broadband Products Division's Sales Administrator for further information.

NOTE: SCC will do it's best to ship a complete unit within 24 hours. In the event of power failure, natural disaster, or any other circumstance beyond the control of SCC or FedEx, the Lifetime Loaner Program could be discontinued. The Gold Standard Support Program is subject to change or modification without notice.

INTERNATIONAL

GOLD STANDARD SUPPORT PROGRAM

This Gold Standard Support Program is designed to give international users of our commercial systems the best possible support and service available. Here is how the program works:

WARRANTY AND SERVICE PROGRAM

In the event of technical problems requiring SCC factory repair during the first 12 months from purchase date, SCC will warrant the cost, including parts and labor, as specified in SCC's Satellite & Broadband Products Limited Warranty and Service Program Policy.* SCC-manufactured equipment in use from years two through seven will be repaired by SCC factory-trained technicians to ensure exacting performance and specification while remaining under the maximum service charge. The maximum service charge will be $150.00. Qualifying merchandise must be assigned a SAR (Satellite & Broadband Advance Repair) number by SCC's Customer Service Administrator. The equipment can then be shipped to SCC, freight prepaid. SCC will return the equipment, freight prepaid. Repair charges will be applied at the out-of-warranty rate in the event of physical or electrical abuse to in-warranty equipment. If SCC, in its sole discretion, determines that a major engineering design change is required, SCC will supply free parts, service information, and technical personnel to assist the customer.

SERVICE INFORMATION

Upon request by a customer, applicable service information will be furnished for each of SCC's International Satellite & Broadband products at no charge.

PARTS AND PRICING

All items not considered to be receivers, LNBs, and accessories shall not be considered as parts and will be available at the dealers current applicable catalogue price.

RETURNED MERCHANDISE

Without the prior consent of SCC, no item purchased by customers hereunder may be returned to SCC for refund or credit for any reason whatsoever.

LITERATURE

A reasonable quantity of English language, international literature will be made available.

NOTE: The Warranty and Service Program is subject to change or modifications without notice.

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